The Milbank Memorial Fund

QUARTERLY

CONTENTS

		Page
In This Issue		111
Maternity Nursing in Rural Homes	*Marion W. Sheahan*	113
Birth Rates and Socio-Economic Attributes in 1935	*Clyde V. Kiser*	128
Birth Control in a Midwestern City	*Regine K. Stix, M.D.*	152
Maternal Health and Supervision in a Rural Area	*Dorothy G. Wiehl* and *Katharine Berry*	172
Annotations		205
The Trend of Differential Fertility in England	*Frank Lorimer*	
Studies in Human Fertility	*Frank H. Hankins*	
The Voluntary Control of Fertility	*Regine K. Stix, M.D.*	

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IN THIS ISSUE

IN THE public health program to provide better care for mothers and babies, emphasis is now being placed on the advantages of nursing assistance at delivery and during the postnatal period. Most cities have visiting-nurse agencies which provide bedside nursing care for home deliveries, but in rural areas it has been necessary for the health department to assume responsibility for making this type of nursing care available. Two experimental programs in rural counties in New York State are described by Miss Marion W. Sheahan, director of the division of public health nursing of the State Department of Health, in the article "Maternity Nursing in Rural Homes." Miss Sheahan discusses the administrative problems which must be solved if the nurses on a generalized nursing service are to provide this maternity care.

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Due to deficiencies in published official data, knowledge of variations in birth rates at the different socio-economic levels of our society must come mainly from special studies. It is therefore most fortunate that data suitable for analysis of this question were collected during the course of the *National Health Survey,* which was conducted in 1935-1936 and included 740,000 families in eighty-four cities of nineteen states.

Through the cooperation of the United States Public Health Service, tabulations of the fertility data are being analyzed at the Fund. Under the title, "Birth Rates and Socio-Economic Attributes in 1935," Clyde V. Kiser presents a second progress report embracing the surveyed native-white, foreign-white, and colored wives of childbearing age in eighty-three cities. For groups subdivided by nativity and color of the wife and by area and size of community, birth rates are presented according to occupational class of the head, educational status of the wife, and by family income and relief status. The data indicate fairly conclusively

that although the families ranking at the lowest rung of the ladder were generally characterized by highest birth rates, the traditionally perfect pattern of inverse association between fertility and socio-economic status is not now universally found among urban marriages. The modifications are suggestive of diminishing importance of differential fertility.

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With the growing recognition of the value of contraceptive clinics in well-rounded maternal health services, it becomes imperative that the policies and procedures of established clinics be carefully assessed. In "Birth Control in a Midwestern City," the second of a series of articles on the clinics of the Cincinnati Committee on Maternal Health, Regine K. Stix discusses the effectiveness of family limitation among patients who had attended a birth control clinic. The single contraceptive method prescribed at the clinic was very effective, but, by the time they were interviewed in a follow-up study, 60 per cent of the patients had given it up. These patients turned instead to the types of contraception used before they attended the clinic. Contraceptives other than those recommended by the clinic were much more effective after the patients had been in contact with a birth control clinic than before.

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In order to develop more effective health services for the care of mothers during pregnancy and the early care of newborn infants in Cattaraugus County, New York, it was first necessary to accumulate information as to the amount and type of care being provided in the area and the extent to which the available services were being utilized. An opportunity to secure this information was afforded by a special morbidity survey made in the area during 1929-1932. In a paper "Maternal Health and Supervision in a Rural Area," Miss Dorothy G. Wiehl and Miss Katharine Berry of the Fund's technical staff present the data gathered during this survey.

MATERNITY NURSING IN RURAL HOMES

MARION W. SHEAHAN[1]

TWO experiences in providing nursing assistance during deliveries in rural homes in New York State have been under way for two years and one year respectively, the former in St. Lawrence County, the latter in a unit comprising two counties, Fulton and Montgomery. The general purpose was to demonstrate the feasibility of including nursing assistance at deliveries as part of a generalized program, this service to be provided for cases unable to employ private duty nurses. Costs, methods, and standards are being studied.

The St. Lawrence experience may rightly be termed a demonstration. That in the Fulton-Montgomery Health District represents the introduction of a new service at a time when it seemed that the staff could absorb it. In both areas the records and reports are being carefully kept and analyzed, with promise of worth-while data when the services have gone through their first growing-pains. At present, these experiences lend themselves only to description and discussion.

The Director of the Division of Maternity, Infancy and Child Hygiene of the State Health Department is in general direction of these experiences. They are part of the Social Security plan to protect the health of mothers and babies. In keeping with the organization of field work in New York State, the work in any one district no matter what its character is under the immediate direction of a District State Health Officer. This plan for district administration appears to be important for the success of any service project. It provides the first-hand knowledge of local needs and situations, a medium through which to develop plans, and the possibility of the state personnel becoming identified with the locality. These appear

[1] Director, Division of Public Health Nursing, New York State Department of Health.

to be of paramount importance in the development and growth of any service, be it experimental or otherwise.

Character of the Counties

St. Lawrence County

St. Lawrence County was selected for a demonstration because the infant, stillbirth, and maternal mortality rates in this County had been consistently higher than in the up-state area as a whole. A study of infant welfare in St. Lawrence County,[3] which was made during 1935, had received the cooperation and interest of the medical profession and of health agencies in that County. The need for better care during the entire maternity cycle was made apparent. The infant survey disclosed the fact that the mortality was 40 per cent higher in the families rated in fair circumstances and twice as high for the families rated in poor economic condition, than for the families in comfortable circumstances. Sixty-seven per cent of the births occurred in the homes, as against 39 per cent in the up-state area.

The County is located in the northwestern corner of the State bordering on Canada, far off the main New York Central line. It covers an area of 2,701 square miles, with a population of 89,549 according to estimates for July 1, 1935. Approximately 57.6 per cent is strictly rural. The average density of persons per square mile is 33, as compared to 120 per square mile for up-state New York. Ogdensburg is the only city, with a population of 15,277. There are four villages, Gouverneur, Canton, Potsdam, and Massena, ranging in population from 2,500 to 10,000. Many acres of wooded land provide rather long stretches of lonely road. The travel in winter is frequently hazardous and slow. The chief occupation is agriculture, 32.7 per cent of the male population being engaged in it, as compared to 12.5 per cent in up-state New York (1930 Census). There

[3] Sayer, Stanley W.: A Study of Infant Welfare in St. Lawrence County in 1935. *New York State Journal of Medicine*, February 15, 1939, 39, No. 4, pp. 314-327.

are three hospitals in the County exclusive of the State Hospital for Mental Diseases and a private tuberculosis hospital, and eight unincorporated maternity homes. There are no midwives, no central nurses' registry, nor visiting nursing agency.

Resident births, including stillbirths, in 1936 numbered 1,705. Of the total births, 982 were born in homes; 57 in homes in the city of Ogdensburg, 159 in Massena Village, 46 in Gouverneur, 24 in Potsdam, and 15 in Canton. The number of births in surrounding country was 681. This geographical distribution indicates the problem of providing an economical "on call" coverage by nurses in all areas of the County. The economic level of the County is such that comparatively few families can afford care by private nurses.

At the time the delivery service started, there were in the County two county nurses receiving 50 per cent financial support from the State, one city nurse, three village nurses, two of them giving part time to community nursing service, seven WPA nurses, and six state nurses. The latter had been in the County a year and had participated in the infant welfare study. At the beginning of the demonstration, five additional nurses were assigned through Social Security funds, making a unit of eleven public health nurses with seven WPA nurses to give assistance. (The latter service had decreased to three by January, 1939.) The county nurses do not participate in the delivery service. The Potsdam community nurse gives delivery service in the village. The Gouverneur nurse, who was on a part-time basis, was dropped during the year but assisted with deliveries while she was there.

The County Public Health Nursing Committee, a quasi-official committee, appointed by the Board of Supervisors according to Section 44A, of the County Law, was cooperative and assumed sponsorship for the new service. The Committee redistricted the County making six, instead of two, districts. The Medical Society approved the plan and expressed interest in it, as did the district of the New York State Nurses' Association. At a meeting attended by the phy-

sicians in the Gouverneur area where the service was first started, it was learned that they, while cooperative, were not clamoring for nursing assistance at deliveries. They frankly stated that they doubted whether a nurse could accomplish much with the lack of conveniences and the level of understanding in many of the homes. They had to be shown!

FULTON-MONTGOMERY HEALTH DISTRICT

This two-county health unit presents a picture directly opposite to St. Lawrence County. The average number of maternal deaths per ten thousand total births for the five-year period, 1932-1936, exclusive of cities, was 52.7 for Montgomery County and 55.2 for Fulton County, as compared to 55.8 for up-state New York. The infant mortality rate for the same period was 48.2 in Montgomery County and 67.0 for Fulton County as compared to 51.2 for up-state New York. While the infant mortality rate in Fulton County was above the state rate, it did not fall within the group of ten counties with excessively high rates in which St. Lawrence County was listed.

Fulton and Montgomery Counties with a total of 900 square miles, form a rough square about thirty miles in each dimension. The population is 60,910 and 47,242 respectively. The former has one city, Amsterdam, with a population of 35,314 and ten incorporated villages located comparatively close together along the Mohawk River. Fulton County has two cities, Gloversville and Johnstown, with a total population of 34,394. The rural population of both counties covered by the delivery service is 38,544. In Montgomery County, the chief rural industry is dairying. In Fulton County, the chief industry is the manufacture of gloves. A considerable amount of home industry is involved.

In 1936, of the 1,414 births in the two Counties, 551 were born to rural mothers, 345 of which occurred in the homes.

This State Health District had been utilized for two years prior to the inauguration of the delivery service as a rural training center

for public health nurses and therefore was operated as a state unit. In the rural areas outside of the three cities, a specialized tuberculosis nurse and a number of school nurses reduce the work of the generalized program of the state nurses. The unit of nine nurses were well acquainted with their districts and the work had become established before the delivery service was started.

There were no general nurses paid from county funds and therefore no County Committee such as existed in St. Lawrence County. Community nursing committees were functioning in each small town or village and were proving helpful to the nursing service, but they had no administrative responsibility to approve or disapprove an activity. The difference is significant. In St. Lawrence County the delivery service became essentially an extension of an existing county nursing service with general direction by the official County Committee. The District State Health Officer and District State Supervising Nurse are professionally responsible for the direction and supervision. Administratively they report to and receive approval of plans and policies from the County Nursing Committee. In the Fulton-Montgomery Health District, the nursing service is a state service with no local citizen group, even nominally, between the District Office personnel and the field nurses. The physicians, as a society, were not as cooperative with the entire service as was the society in St. Lawrence County, but on the other hand many individual physicians had asked for assistance with deliveries.

It might be said that the fact the physicians in St. Lawrence County were not eager for assistance in the homes during a delivery was a surprise. It had been assumed that physicians everywhere would welcome such assistance without question and that the entire problem related to providing it. Further extension of this service in other counties will prove the point.

Plan in St. Lawrence County

The usual preparation for initiating a new service was done. A

general planning conference was held between the District State Health Officer, the District State Supervising Nurse, the special supervisor for the delivery service, and the Director of Division of Maternity, Infancy and Child Hygiene and the Director of Division of Public Health Nursing of the central office in Albany. Some of the decisions which have guided the service have probably inhibited its growth and have also caused some of the administrative problems. However, at the moment it is believed the inhibitions have been for the most part wise to prove certain points connected with such a service.

The general plan under which the service has operated was as follows:

1. Local support should be secured as it could be obtained. This was defined for immediate purposes to be office space, furniture, janitor service, telephone service, if possible, and supplies or other facilities.

2. The service was to be started in the Gouverneur area. (The District State Office is located there) and gradually extended to other areas as the nurses became established and the locality assumed some support. Ogdensburg City was not to be included, at least not until the rest of the County was covered.

3. The State's contribution of eleven nurses was to remain fixed at that number, if possible; the added nurses as needed to be provided by the County with state aid. Eventually the number of state nurses would be reduced, at least to the point where the County would share the costs on equal basis with the State. St. Lawrence County has been adversely affected by economic depression so the possibility of increased county appropriations was not at all assured. (To date no additional county support has been provided.)

4. The services of private duty nurses were to be utilized on a delivery fee basis to relieve the public health nursing service.

5. Nursing service would be given whether or not the case had been previously registered for antepartum supervision.

6. Since this was a demonstration to study the pattern which would make a nursing service at deliveries possible as part of any generalized service, no equipment was to be carried by the nurses for use of the physicians, except the obstetrical package. This package is commonly

provided all through the State as part of routine preparation for a home delivery.

The County was divided into six areas. When the staff was complete, three nurses were to work as a unit in the largest center, two in each of the three next in size, and one in each of the two smallest. The factors which had to be considered were road conditions, location of physicians, telephone service, and availability of office space, as well as the community needs. The living arrangements which could be secured in some of these small areas, plus the social and professional isolation, have contributed to the problem of securing a qualified and stable staff.

Each nurse answers delivery calls in her own area, but is never actually "on call" unless she knows a delivery is imminent; then she keeps in touch with the physician. Nurses have telephones in their residences and when necessary an extension to their rooms will be provided at state expense. Physicians have the nurses' telephone numbers and their daily schedule of calls if a delivery is pending. They are responsible for reaching the nurse. From checks, it has been determined that few calls are missed. The intimate knowledge of the happenings in a rural area by everyone makes it quite possible to locate as public a character as "The Nurse" without too great trouble. If the physician must call the area nurse on long distance because he resides in another district, he may reverse the charge. If he cannot locate a nurse he may call the Gouverneur office reversing the charge. When this plan was outlined as the only one that seemed expedient at the time, it was thought the physicians would not bother to call the nurse. The answer is that he does. When calls overlap or if relief is needed because of a long labor, the nurse calls another public health nurse if more than one is assigned to the area; or she may call a private duty nurse who has previously been listed for such service. Instructions regarding procedures to be followed, records, reports, etc., must be accepted and followed by any private duty nurse who is placed on the "call" list. If no relief nurse

is available in the area, the Gouverneur office is called at any time of day or night.

It can readily be seen that this situation presents a problem. If the roads are good and the home not too remote from the nearest nurse, and a telephone is available, relief or assistance can always be provided within reasonable time; if the reverse situation is the case, relief is delayed. The result is that on occasions, especially during the winter, nurses work long hours overtime. Different plans have been made to obviate this, but to date no satisfactory solution has been found.

Overtime is made up, but for the most part it accumulates to be taken as a block of time within the succeeding month. Some of the nurses do not object to this, especially if they live at a distant point. However, it is felt that much accumulated fatigue is occurring which is not good for the physical well-being of the individuals concerned.

One of the human elements in dealing with this question of overtime is the attitude of the nurses regarding their patients. They may on occasions grumble to their confreres or supervisors, but when a delivery is pending, they do not wish to turn it over to another nurse; and frequently they do not call for relief when it might be provided. The patient naturally wants "my nurse" and the nurse wants to see "my patient" through. More careful study will be given to this problem. It is recognized as one of the serious administrative problems which will become more acute with the growth of the service. An additional supervisor is being assigned to the District making more help available to study the situation. At the moment the thought is that the immediate answer lies in the recruiting and instruction of more private duty nurses and in a more conscious effort to control the over-willingness of the staff.

During 1937, of the total of 902 home deliveries, 291 occurred in territories not covered by the service. The village of Massena in which 145 of these births occurred, and the six towns along the St.

Lawrence River received no delivery service in 1937. The former was included in 1938 and a partial plan has been made for the latter beginning January, 1939.

RÉSUMÉ OF REPORT OF 1937

827 antepartum visits to 233 cases (there were 766 cases in 1938)
286 home deliveries attended, 2 sent to a hospital (there were 446 attended in 1938)
203 by state nurses
23 by two village nurses
60 (including 17 in Ogdensburg) by three WPA nurses
1,906 postpartum visits made
286 infants born
274 living infants
11 stillbirths (6 premature, 5 full term)
1 died at delivery
6 died during the neonatal period (one from an accident in the home)

The month of gestation in which patients who received home delivery service registered with a physician or with the nursing service is shown in Table 1. Twenty-three per cent of the cases were under nursing supervision before the sixth month of gestation.

As shown in Table 2, over half of the patients receiving home delivery service were referred to the nursing service by a physician.

There were no maternal deaths in the group given delivery service. The maternal mortality rates for the entire County have shown an encouraging trend for the past three years.

	St. Lawrence County	*State (Exclusive of New York City)*
1936	84.6	50.7
1937	63.0	39.3
1938	21.8	35.9

No complete report for 1938 is available as yet for the work in St. Lawrence County. A time study is being analyzed and it is expected a comprehensive report will be available in the near

Month of Gestation	Number of Cases		Per Cent of Cases	
	Physician	Nurse	Physician	Nurse
Total Cases	286	286	100.0[1]	100.0
1	2	0	1.3	
2	19	9	11.9	3.1
3	11	11	6.9	3.8
4	23	19	14.5	6.6
5	21	27	13.2	9.4
6	12	27	7.5	9.4
7	23	44	14.5	15.4
8	16	44	10.1	15.4
9	32	105[2]	20.1	36.7[2]
Unknown	127			

[1]Percentage distribution based on number of cases for which month of gestation was known.
[2]Includes cases for which no service was given before delivery.

Table 1. Month of gestation in which patients who received home delivery service were registered with a physician and with the nursing service.

future. A recent letter from Dr. Stanley Sayer, the District State Health Officer, to an official in the County will, however, be interesting:

Last year, there were 766 prenatal cases carried, 446 home deliveries attended, and 761 postpartum cases. More than 50 per cent of the entire time of the state nurses is devoted to this program.

As you know, the infant mortality rate has been very high in St. Lawrence County, the County having been the third highest in the State. This rate has been declining during the past three years, and for the first eleven months of 1938, the provisional rate is 46 per 1,000 which is

Table 2. Source of referral of maternity cases registered with nurses.

Source of Referral of Maternity Cases	Distribution of Cases According to Source of Referral to Nurse	
	Number	Per Cent[1]
Any Source	286	100.0
Physician	163	58.2
Self	43	15.4
Welfare Officers	7	2.5
Nurses	20	7.1
Family Members	17	6.1
Another Patient	6	2.1
Neighbors to Nurse	21	7.5
State Troopers	2	.71
Clinic	1	.36
Unknown	6	

[1]Percentage distribution based on known cases.

approximately that of up-state New York. The maternity death rate for the year 1938 will, I believe, be the lowest ever recorded.

Plan for Fulton-Montgomery Health District[3]

Unlike St. Lawrence County, the Fulton and Montgomery District was not selected for a delivery demonstration. The demand came from physicians, particularly those who had had such assistance from WPA nurses. In December, the Montgomery County Medical Society passed a resolution requesting the District State Health Officer to establish a delivery service.

The description of this district at the beginning of this article as compared to the St. Lawrence County area will point out the variations in the problems related to the establishment of similar services in two totally different territories. Only a few of the plans in the Fulton-Montgomery District will be mentioned as they compare with the plans in the north country demonstration.

Prior to January 1, 1938, on which date the delivery service was started, there were nine nurses working from five nursing offices in the district with the total area divided into nine working districts. The staff was not increased. The nursing offices were reduced to three, continuing the nine districts with some reallocation of territory. Three nurses worked out of each office, thus making relief readily accessible at all times. Suitable offices were furnished, clerks were provided to receive day calls and to help with clerical work, and suitable arrangements were made for after office hour calls. A grant of money from the International Health Division of the Rockefeller Foundation provided the funds. In one district the physician's telephone exchange was used, in a second a maternity home where the telephone was always covered, and in a third a telephone was installed by the bedside of a home-bound cripple who was glad to earn some money. It will be noted that in St. Law-

[3] A report of the first six months of this service is given in an article, "Home Delivery Service" by James E. Perkins, M.D., and Florence B. Williams, which is to be published in the March, 1939, issue of *Public Health Nursing*.

rence County a new group of nurses were introduced for the service, the nursing offices were increased from two to six and no telephone routine coverage was arranged to receive calls.

The nurses in each of the three offices rotate being "on call" for delivery and respond to any call within the entire area served by that particular office. No nurse is on second call. Each nurse leaves a plan of work for the day and can usually be reached if overlapping calls are received. As in St. Lawrence County, a list of private duty nurses is kept who may be used as necessary. The above plan means that a nurse is "on call" every third twenty-four hour period and every third week-end. Overtime is made up immediately following its occurrence. The Saturday morning following the week-end "on call" is allowed to compensate for the restriction of keeping within reach of a telephone message.

Again attention should be called to the difference in the St. Lawrence County plan where it is not possible to have at least three nurses assigned to each office. The difference in telephone service arrangement is another important factor.

The service was offered to the physicians by means of a carefully prepared bulletin and a letter addressed to each one, personally. Nursing assistance was offered during delivery but not during the entire period of labor. Only patients registered for antepartum care with their physicians by the sixth month of pregnancy and who had been referred to the nursing service were to be given nursing assistance. It was explained that this policy was to encourage early medical care but that no call from a physician would be refused. In St. Lawrence County the service is more nearly a labor service since nurses stay in the home, if necessary, between the first examination by the physician and the actual birth of the baby. The long distances involved in St. Lawrence County makes it impracticable for a nurse to leave a home for some other calls in the neighborhood, and to return at the time the doctor decides he must remain in the home. It is believed that the doctors in the Fulton-Montgomery

District would be more satisfied with a complete labor service and that such a service would in turn be a more adequate one for the patient.

REPORT OF SERVICE

During the year 1938, 535 births occurred in the rural area of which 317 were born in the homes. Of this total, 306, or 57.1 per cent, were carried for antepartum nursing supervision. Of the 317 patients delivered at home 223, or 70.3 per cent, received antepartum supervision as compared to 83, or 38 per cent, of the 218 delivered in hospitals. A total of 1,244 antepartum visits were made, making an average of four visits per case. Assistance was given with 149 deliveries. Postpartum visits numbered 1,092, averaging 7.4 visits per case.

Time Consumed in Delivery Service

	Hours
Actual time spent in home assisting at 149 deliveries	642.15
Average per delivery	4.30
Travel time	96.
Average per delivery	.65
Average time per delivery including travel	4.95

Effect of Delivery Service on Entire Program

The delivery service in the St. Lawrence County has inhibited the fullest development of other phases of the program. However, a one-month time study completed March first of this year, but not completely analyzed as yet, shows an encouraging diversity of family health service given by the nurses in the delivery unit. Within the next few weeks when the reports and records of the last year will have been tabulated a critical analysis of the accomplishments, personnel status, and service policies will be made. It is already evident that an increase in staff is imperative if the demonstration is to be carried to its logical conclusion: that is to develop an adequate generalized family health service with a complete maternity service as an integral part of the program. Possibly the

next six months will determine whether the delivery load of the past year, approximately 50 per cent of the total home deliveries, is a static average.

The generalized program in the Fulton-Montgomery area has not been seriously affected, although the present delivery load is about all the present staff can carry in addition to the rest of the program. The interference which has occurred has been caused by a short staff due to two resignations and to illness.

Summary

While no definite conclusion can be drawn, a few general comments might be made based on these two experiences as they have progressed to date.

The character, geography, population distribution, and the social and economic situation in counties will simplify or complicate the provision of a delivery service more acutely than do these same situations in relation to other services.

It is reasonable to believe that there may be certain county situations where a delivery service could not be arranged for an entire area with any degree of economy.

The utilization of private duty nurses appears entirely feasible but not as easily secured as might be thought.

The integration of delivery service in a generalized service is practicable if the necessary adjustments can be made and controlled.

The emergent nature of the service requires more staff, or some certain way of assuring sufficient nurse power to keep pace with the growing demands for assistance at delivery.

It appears necessary to arrange for an adequate budget to take care of such overhead as complete telephone coverage, necessary nursing relief, and for more administrative supervision than is necessary in a service which lends itself to routine. From a nursing point of view, this seems the crux of the situation as far as administration and economical use of nursing power is concerned.

The integrity of the generalized service, other than delivery, can only be safeguarded if the above administrative overhead is provided for. The very nature of a delivery service gives it preference in the list of services.

From the data available to date it is reasonable to believe that a delivery service is an important, if not the most productive service, in securing family and medical cooperation in maternal and child care. It appears to influence favorably the possibility for more and earlier antepartum supervision and improvement in infant hygiene following birth of the baby.

There is reason to believe that nursing assistance at deliveries is an important factor in assuring a relatively clean, if not an aseptic delivery in most of the homes.

Nursing care of the mother during the entire labor period is in demand. It seems possible to provide it.

While actual costs are not yet available, it appears the case cost, even though high, is a reasonable public expense when all the factors surrounding the loss of a mother are considered.

For the most part the nurses themselves quickly become interested in the delivery service even though their first reaction may be to object to a service which implies certain restrictions of their usual free time. It is evident that staff morale can be maintained if reasonable compensation is provided. Compensation in extra time appears to be satisfactory. (A cash bonus arrangement has been suggested but cannot easily be worked out in Civil Service.)

BIRTH RATES AND SOCIO-ECONOMIC ATTRIBUTES IN 1935[1]

CLYDE V. KISER[2]

THANKS to official data and to analyses based thereon our knowledge of certain broad demographic aspects of the declining birth rate has been kept abreast of the times. It is known, for instance, that birth rates of foreign populations in this country were conspicuously high twenty years ago but are not now much higher than among native whites in the same areas. The substantial Negro migration from farms to urban centers since the World War has apparently been accompanied by marked reductions in birth rates, and the traditional characterization of Negroes as highly prolific is undergoing a change. The gap between reproductive levels of urban and rural populations is wide and will probably remain so for a long time. Nevertheless, there is evidence that the present declines in the birth rates are more pronounced among rural than among urban populations.

Concerning the question of relative trends in the birth rates among populations classified along socio-economic lines, however, our knowledge is far less definite. A bench-mark of class differences in fertility in this country was afforded by the well-known analysis of Census data collected in 1910.[3] That study indicated that thirty years ago there was, among native-white populations, a sharp and consistent inverse relation between fertility and occupational status. Since that time, and especially since 1920, there have been substan-

[1] A progress report based upon National Health Survey data for married women of childbearing age. The author wishes to express his gratitude to the United States Public Health Service for its cooperation in making these data available.

[2] From the Milbank Memorial Fund. The writer wishes to thank Mr. Robert B. Reed and Miss Dorothea Schramm for their painstaking work in computing rates for this study.

[3] Sydenstricker, E. and Notestein, F. W.: Differential Fertility According to Social Class. *The Journal of the American Statistical Association*, March, 1930, XXV, New Series, No. 169, pp. 9-32.

tial declines in the general birth rate. Have those declines left unchanged the pattern of the birth rates for the several social classes and, if not, what has been the nature of the modification?

Recently, two preliminary reports based upon independent sets of data have provided similar indications of a change in the pattern of class differences in fertility among native-white urban marriages in selected areas. This change consisted in the failure of the classes ranking topmost socially and economically to maintain lowest birth rates. One of these studies was Notestein's analysis of unpublished family data from the 1930 Census for the East North Central States.[4] The other was by the writer[5] and pertained to fertility data collected in five cities during the course of the *National Health Survey*.

Since the present paper is a further progress report on the analysis of fertility data collected by the *National Health Survey*, a brief statement of the nature of that material may be in order at this point. The main purpose of the *Survey* was to collect comprehensive data concerning incidence and severity of illness in various elements of urban populations. Detailed records were secured in a house-to-house enumeration of about 740,000 families residing in eighty-four cities of nineteen states.[6] This work was conducted by the

[4] Notestein, F. W.: Differential Fertility in the East North Central States. The Milbank Memorial Fund *Quarterly*, April, 1938, xvi, No. 2, pp. 173-191.

[5] Kiser, C. V.: Variations in Birth Rates According to Occupational Status, Family Income, and Educational Attainment. The Milbank Memorial Fund *Quarterly*, January, 1938, xvi, No. 1, pp. 39-56.

[6] The cities included in the *Health Survey* are listed below by size and by area. Baltimore was included in the *Survey* but not in the fertility tabulations by virtue of atypical sampling procedure in that City.

500,000 and Over
East: Boston, Mass.; Buffalo, N. Y.; New York, N. Y.; Philadelphia, Pa.; Pittsburgh, Pa.
Central: Chicago, Ill.; Cleveland, Ohio; Detroit, Mich.; St. Louis, Mo.
Pacific: Los Angeles, Cal.
100,000–500,000
East: Fall River, Mass.; Newark, N. J.; Trenton, N. J.; Syracuse, N .Y.
Central: Cincinnati, Ohio; Columbus, Ohio; Flint, Mich.; Grand Rapids, Mich.; Minneapolis, Minn.; St. Paul, Minn.
South: Birmingham, Ala.; Atlanta, Ga.; New Orleans, La.; Dallas, Tex.; Houston, Tex.; Richmond, Va.
Mountain: Salt Lake City, Utah.
Pacific: Oakland, Cal.; Portland, Ore.; Seattle, Wash.; Spokane, Wash.
25,000–100,000
East: Pittsfield, Mass.; Lebanon, Pa.

(Continued on page 130)

United States Public Health Service with funds from the Works Progress Administration.

A detailed account of the methods of selecting cities and the sampling procedures is available elsewhere.[7] Suffice it to say that the procedure was designed to yield geographic representativeness of the urban populations for the broad East, South, Central, and Western areas. On the other hand, for reasons of administrative expediency, the *Survey* was not designed to be representative in so far as distribution of the urban population by size of community is concerned. The proportion of schedules from cities of 100,000 population or over is too high and the proportion in cities of smaller size too low. Nevertheless, it is believed that within each surveyed city[8] a cross-section of families was secured with respect to socio-economic status and demographic attributes. In all except one of the cities under 100,000 population selected for the *Survey*, attempts were made at complete enumeration and in cities of larger size the sampling was designed to yield internal representativeness.

The schedules used in the *Survey* afforded data concerning number of births, by type of issue, to surveyed women during the twelve months preceding enumeration. By utilizing available descriptive data, it was possible to compute annual birth rates, approximately

Central: Lima, Ohio; Port Huron, Mich.; Springfield, Mo.
South: Montgomery, Ala.; Monroe, La.; Amarillo, Tex.; Wichita Falls, Tex.
Pacific: Salem, Ore.
Under 25,000
East: Greenfield, Mass.; Ipswich, Mass.; Bridgeton, N. J.; Lambertville, N. J.; Somerville, N. J.; Hudson, N. Y.; Newark, N. Y.; Penn Yan, N. Y.; Duryea, Pa.; Indiana, Pa.
Central: Benton, Ill.; Normal, Ill.; Houghton, Mich.; Chisholm, Minn.; Willmar, Minn.; Winona, Minn.; Chillicothe, Mo.; Clinton, Mo.; Franklin, Ohio; Wilmington, Ohio.
South: Eufaula, Ala.; Gadsden, Ala.; Greenville, Ala.; Brunswick, Ga.; Abbeville, La.; Bossier, La.; Minden, La.; Weatherford, Tex.; Covington, Va.; Farmville, Va.
Mountain: Bingham Canyon, Utah; Eureka, Utah; Tooele, Utah.
Pacific: Chico, Cal.; Grass Valley, Cal.; Jackson, Cal.; Napa, Cal.; Vallejo, Cal.; La Grande, Ore.; St. Helens, Ore.; Ellensburg, Wash.; Olympia, Wash.

[7] The National Health Survey 1935-1936 (Significance, Scope and Method of a Nation-Wide Family Canvass of Sickness in Relation to its Social and Economic Setting). Preliminary Report J-1303, Division of Public Health Methods, National Institute of Health, The United States Public Health Service, Washington, 1938 (11 pp. mimeographed).

[8] Throughout this report when reference is made to "each" or to "combined" urban areas of the *Survey*, Baltimore is excluded for reasons indicated in footnote 6. The *Survey* also collected relatively small samples from rural counties in three states but the report on the fertility data from those areas will appear at a later date.

as of the year 1935, among married women of childbearing age classified with reference to color and nativity of the wife and with respect to selected socio-economic attributes. It is the purpose of this progress report to make available the broad results of some of the computations preliminary to the issuance of a contemplated monograph, which will cover additional materials and will aim at more critical appraisal of the data herewith presented.

Table 1. Number of married women 15-44 years of age canvassed in the urban[1] areas of the *National Health Survey* and embraced in this report, by color, nativity, area, and size of city.

Size of City, Nativity and Color of Wife	All Areas	East	Central	South	Mountain	Pacific
All Sizes						
Total	375,658	125,434	125,427	76,799	5,681	42,317
Native White	284,246	88,219	99,693	55,171	5,167	35,996
Foreign White	51,901	29,587	17,112	822	446	3,934
Colored	39,511	7,628	8,622	20,806	68	2,387
500,000 and Over						
Total	158,953	81,124	65,674	[a]	[b]	12,055
Native White	108,529	53,922	45,595			9,012
Foreign White	36,380	21,502	13,681			1,197
Colored	14,044	5,800	6,398			1,846
100,000-500,000						
Total	116,450	23,401	30,302	41,796	4,116	16,835
Native White	90,429	16,706	26,573	28,855	3,735	14,560
Foreign White	10,490	5,356	2,240	604	348	1,942
Colored	15,531	1,339	1,489	12,337	33	333
25,000-100,000						
Total	55,233	9,230	19,017	23,412	[b]	3,574
Native White	46,926	7,810	17,712	17,984		3,420
Foreign White	2,366	1,347	712	160		147
Colored	5,941	73	593	5,268		7
Under 25,000						
Total	45,022	11,579	10,434	11,591	1,565	9,853
Native White	38,362	9,781	9,813	8,332	1,432	9,004
Foreign White	2,665	1,382	479	58	98	648
Colored	3,995	416	142	3,201	35	201

[1]Exclusive of Baltimore and exclusive of wives of unreported color or nativity.
[a]Cf. footnote 1 above.
[b]No cities this size or no survey.

Specifically, the paper presents an analysis of birth rates among all native-white, foreign-white, and colored married women of childbearing age in the combined and classified urban areas of the *Survey,* by occupational class of the heads, educational status of the wives, and amount of family income during the twelve months preceding the enumeration. The total number of cases involved was 375,658 and these were distributed by nativity, color, area, and size of city as indicated in Table 1. For interpretation, chief reliance should be placed upon the data classified by area and size of community, because the rates based upon the combined data have not yet been adjusted for the over-weighting of large cities in the sample.

BIRTH RATES BY NATIVITY AND COLOR, AREA, AND SIZE OF CITY

Perhaps the most radical change in the pattern of group differences in fertility during the past twenty years is that wrought by the rapid decline in birth rates among our foreign born. This may not be commonly realized despite its emphasis in the literature during the past decade. Another popular misconception is that birth rates among our colored populations are universally high.

In the combined data for all urban areas included in the *Survey,* the standardized birth rate[9] in 1935 per 1,000 wives of childbearing age was 96 among native whites, 111 among foreign whites, and 86 among the colored. The rate for the foreign whites was, therefore, about 16 per cent higher than that for native whites of similar age, and the rate for native whites, in turn, surpassed that for the colored wives by 12 per cent. A further characteristic of the comparisons by nativity and color emerges from the plotting of age-specific rates in Figure 1. It is seen that the birth rate among colored wives of youngest ages (under 20) was conspicuously high.[10]

[9] Adjusted to the age distribution of all married women 15-44 in the United States, as computed from the 1930 Census.

[10] This situation is also found in data compiled by Whelpton for the National Resources

(Continued on page 133)

Throughout ages 20-34, however, the rates for native whites were 12 to 38 per cent higher than among colored wives, and at these same ages the rates for foreign-white wives surpassed those of native whites by 11 to 22 per cent.[21]

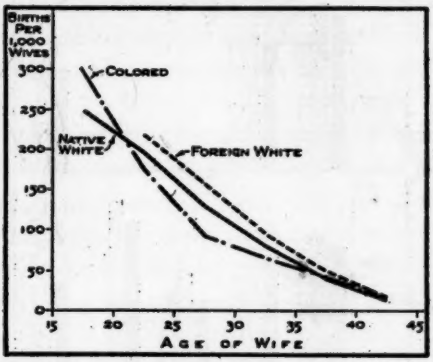


Fig. 1. Age specific birth rates in 1935, among wives 15-44 years of age in the *Health Survey*, by nativity and color. Surveyed cities combined.

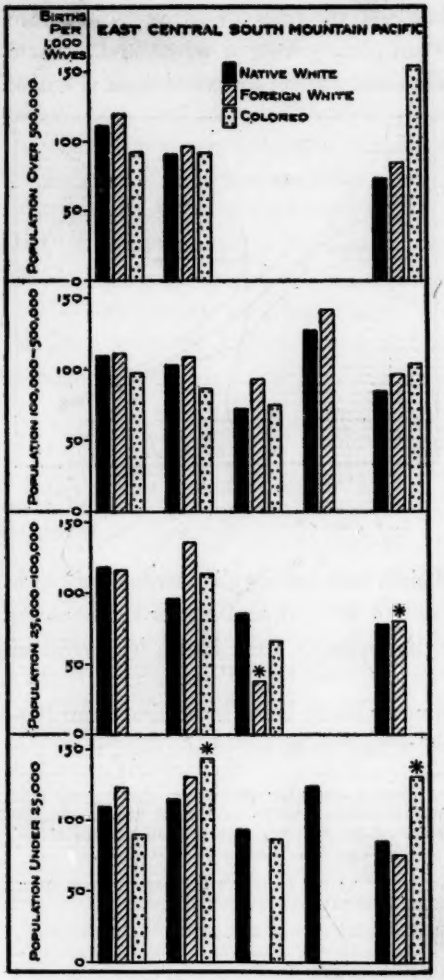
More valid comparisons of birth rates by nativity and color are those presented by broad region and size of community in Figure 2. In the four groups of Eastern and Central cities of 100,000 population or more, where the foreign whites are numerically most important (see Table 1), the standardized birth rates among alien women of childbearing age ranged from only 2 to 8 per cent higher than among the native whites. Wider discrepancies were found in several of the other groups of cities.

In regard to the colored wives, there is the indication from Figure 2, that within specific urban areas sampled (except on the

Committee. The excessive fertility of Negroes over whites at youngest ages has also been found to be enhanced when the analysis is made with reference to all women of childbearing age. Involved in this situation are the relatively high proportions married and relatively high rates of illegitimacy among Negro females under 20 years of age.

See: National Resources Committee: POPULATION STATISTICS (2). State Data, October, 1937. U. S. Government Printing Office, Washington, D. C., pp. 1-8.

[21] A description of present-day differences in birth rates by nativity would be incomplete without calling attention to the diminishing numerical importance and changing age structure of foreign-white married women in our population. Since immigration restrictions, of course, foreign-white wives have passed into the older ages of- and out of the childbearing period. Only 4 per cent of the foreign-white wives enumerated were under 25 years of age as compared with 17 per cent among the native whites and 20 per cent among the colored. The actual birth rates unadjusted for age were substantially lower among the foreign-white wives of childbearing age than among the native whites or colored, being 69, 93, and 88 respectively.



*In this and succeeding charts: rate based on 100–300 cases. (Rates based on fewer than 100 cases not shown.)

Fig. 2. Standardized birth rates in 1935 among wives 15-44 years of age by nativity and color of the wife and by area and size of surveyed cities.

Pacific Coast where Mexicans and yellow races were included in larger proportions) the birth rates of the colored wives were in most instances as low as or lower than those exhibited by the native-white women. This held true even in the Southern cities and towns included in the *Survey*.[12]

The rates depicted in Figure 2 do not conform in all respects to the traditionally observed types of variation by area and size of community. The observance of lowest rates for native whites on the Pacific Coast and highest in the Mountain

[12] Notestein, using 1930 family Census data for the East North Central States, also found that fertility rates were universally lower among Negro marriages than among native-white marriages in all types of communities except the rural farm. He also discovered that the relatively low rates among urban Negroes in that area arose exclusively from the higher proportions of childless families among the Negroes.

See Notestein, F. W.: *op cit.*, pp. 179-185.

area (Utah) are in accord with expectations. Somewhat surprising may be the indications of relatively low birth rates among native whites and Negroes in the urban South. Likewise, although the average birth rates observed in cities of 100,000 or more population were generally lower than in cities of smaller size, there was little further refinement in the indicated inverse relation between fertility and size of community.

An adequate appraisal of the data from the above points of view must await more intensive study of the situation than has been possible for this report. There may have been less complete enumeration of births in the South than in other areas. Furthermore, the nature of the comparisons may be inherent in the choice of the particular cities in given area-size groups. It must be borne in mind, however, that we are concerned here with *urban married* women. Other data have indicated that important factors in the high general birth rate in the South as a region are early marriages and high fertility levels in rural areas (especially in rural areas where poverty is prevalent) and the high proportion of the Southern population thus affected. In fact, data prepared for the National Resources Committee have indicated birth rates too low for population replacement among native-white women in cities of 25,000 population or more in each Southern state represented in the *Survey*. This situation held for Negro women in urban areas of all sizes in the same states even after making allowances for under-enumeration.[12]

[12] *See:* National Resources Committee:

(a) THE PROBLEMS OF A CHANGING POPULATION. U. S. Government Printing Office, Washington, D. C., 1938, pp. 132-133.

(b) POPULATION STATISTICS (1). National Data. U. S. Government Printing Office, Washington, D. C., 1937, pp. 40-50.

Note: The report (b) above included data for individual cities of 100,000 population and over. The data concerned number of children under 5 years of age per 1,000 women aged 20-44 years, by nativity and color. (Rates standardized and data corrected for under-enumeration.) When the rates for individual cities of 100,000-500,000 population represented in the *Survey* for Eastern, Central, and Southern areas, respectively, were examined it was found that the average rates for both the white and colored women in the surveyed large cities of the South were somewhat lower than the corresponding averages in Eastern and Central areas. (In computing average rates for native-white and colored women in the

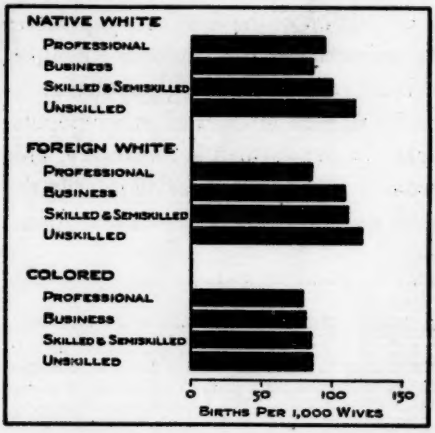
(Continued on page 136)

The bearing of the above possible factors will be investigated as fully as possible for the final analysis.

BIRTH RATES BY OCCUPATIONAL CLASS OF THE HEAD

The data from the entire *Survey* generally confirm the indications from the preliminary report concerning the present nature of occupational differences in birth rates among native-white urban marriages. Contrary to the situation revealed by studies of 1910 Census materials, in the present survey, the combined data for the native whites indicated higher rates for wives of professional men than for wives of business men. Aside from this the picture was one of inverse association between occupational status and fertility. The birth rates among all wives 15-44 in the urban areas of the *Survey* are given by occupational class of the head and by nativity and color of the wife in Figure 3.[14]

Fig. 3. Occupational class of the head in relation to birth rates in 1935 among wives 15-44 years of age, by nativity and color of the wife. Rates standardized for age and surveyed cities combined.



In the classification of the data for native-white wives by area and by size of community, Figure 4, it was also found that in most instances the rates for wives of business men were as low as or lower than those found for wives of professional men. Actually, in most cases there was little or no statistical significance to the

three respective areas, the rates for the individual cities were weighted according to the distribution, by city, of surveyed females within the respective area-size groups.)

[14] To avoid duplicate publication of many detailed tables, the actual rates and numbers of women involved in the several socio-economic classifications are not contained in this preliminary report but will appear in the completed monograph.

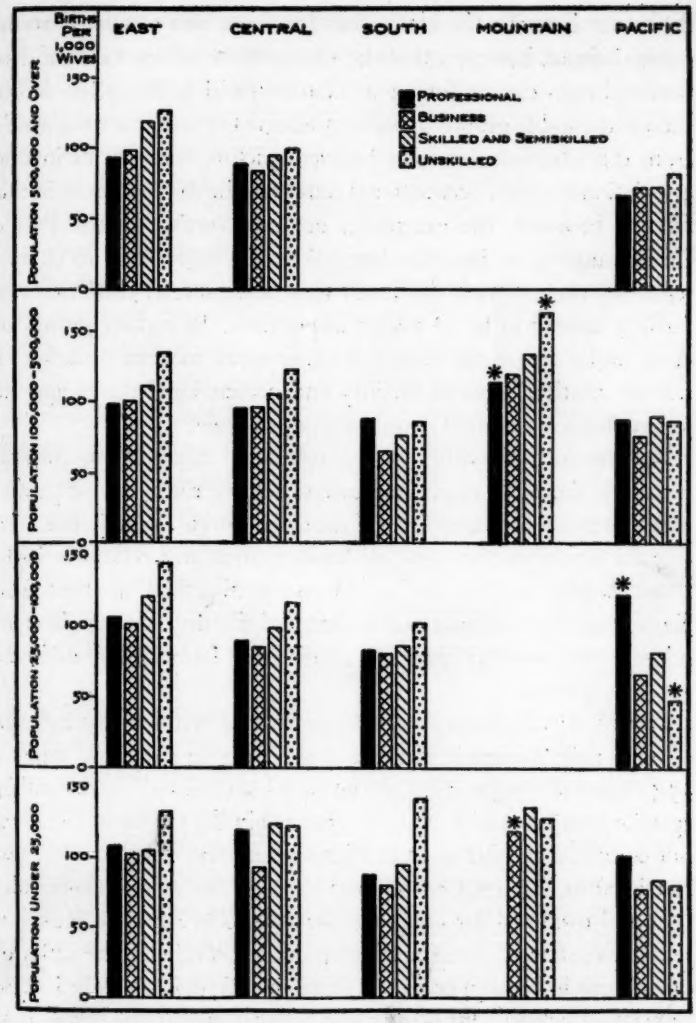


Fig. 4. Occupational class of the head in relation to birth rates in 1935 among native-white wives 15-44 years of age, by area and size of surveyed cities. Rates standardized for age.

difference between the birth rates for those two classes. It seems fairly definite, however, that the native-white urban wives of professional men can no longer be characterized as being less fertile than comparable groups of women married to business men. Aside from this situation the more frequent picture was that of inverse association between occupational status and birth rates. Even in this respect, however, the exceptions are noteworthy. In the Pacific Coast samples, for instance, low levels of fertility seem to characterize all classes, with the result that occupational differences in fertility appear to be of minor importance. In certain groups of cities under 25,000 population in other areas, too, the principle of inverse relation between fertility and occupational status appears to have been manifested in only a crude manner.

Among foreign whites in the combined areas of the *Survey*, Figure 3, the birth rates were lowest among the wives of professional men and advanced with lowering of occupational class. The rate for foreign-white wives of business men was relatively high, about as high as that for skilled and semi-skilled workers. The above two characteristics of differential fertility among foreign-white wives, however, were not consistently found in the different area-size groups.

Due to the small number of foreign-white wives under 25 years of age in the *Survey* it was found necessary to restrict to women 25-44 years of age the subdivisions by socio-economic status within specific groups of cities. The rates plotted in Figure 5 are, therefore, not comparable with those in Figures 3, 4, and 6. Figure 5 is also restricted to Eastern, Central, and Pacific cities of 500,000 population and over and for cities 100,000-500,000 in size, the most important centers of foreign-white residence. Only in the cities of largest size in Eastern areas was there manifested a straight inverse association between birth rates and occupational status. From consideration of the numbers of foreign women in the various area-size groups (see Table 1), it is apparent that the results observed in

Eastern cities of largest size heavily influence the average picture for foreign whites in the *Survey* shown in Figure 3. In Central cities of 500,000 population or more all classes except the professional were represented by substantial numbers and yet little in the way of class variations was observed in the fertility of the business, skilled, and unskilled classes. In other groups of cities the small numbers in extreme classes prohibit generalization but afford at least suggestive evidence that birth rates among foreign-born wives of business men are as high as those of skilled workers.

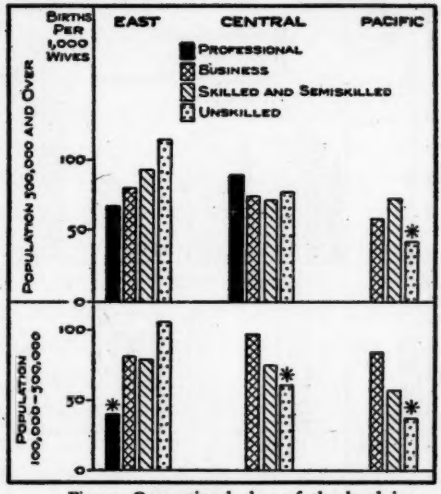


Fig. 5. Occupational class of the head in relation to birth rates in 1935 among foreign-white wives 25-44 years of age, in selected groups of surveyed cities. Rates standardized for age.

Several points of interest emerged from the analysis of data for colored wives. In the first place it should be stated that the great majority of cases were in the two laboring classes. Of the approximate 40,000 colored wives of childbearing age in the *Survey,* only 2 per cent reported that heads of the families were professional men, 8 per cent business, 37 per cent skilled and semi-skilled workers, and 53 per cent unskilled laborers. Stated in another manner, 10 per cent of the colored heads were in "white-collar" pursuits as compared with 44 per cent reported by the native-white wives and 30 per cent reported by the foreign-white wives.

The combined data for the colored sample, Figure 3, would appear to indicate virtual uniformity of low birth rates among urban

colored families rather than differentiation of fertility by occupational class. The slight variations that did exist, however, were in the direction of inverse association with occupational status. The classification of the data by area and size of community, Figure 6, perhaps affords a somewhat more accurate picture of the situation. On the whole, the relatively few "white-collar" workers were characterized by somewhat lower birth rates than the laboring classes in urban areas. On the other hand, there appeared to be little difference between the birth rates among wives of skilled or semiskilled workers and those among wives of unskilled laborers, the two predominant groups. In general, then, it would appear that the facts of outstanding importance are the relatively low fertility[15] of

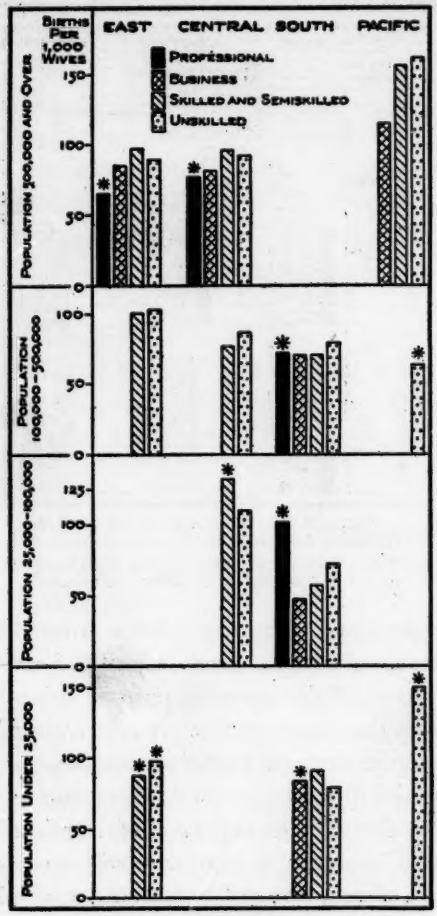


Fig. 6. Occupational class of the head in relation to birth rates in 1935 among colored wives 15-44 years of age, by area and size of cities. Rates standardized for age.

[15] As previously stated, the

(Continued on page 141)

Negro wives under urban conditions, the heavy concentration in the laboring classes, and the lack of consistently manifested skilled-unskilled differences in birth rates.

BIRTH RATES BY EDUCATIONAL ATTAINMENT OF THE WIFE

Returns concerning educational status of wives provided for only a two-fold division of those reporting more than common school education, i.e., "entered college" and "entered high school." For wives who never entered high school, however, detailed data were recorded and tabulated according to last grade attained. In the present report on the relation between educational status and birth rates of wives the subdivisions by grade status are shown in fairly detailed form only for the combined cities. For the breakdown of data by area and size of community, only four broad classifications by educational attainment were used.

A generalized picture of the association between birth rates and amount of schooling received by the wives is given in Figure 7, based upon data for the combined cities. With certain qualifications it is apparent that birth rates varied inversely with educational status among wives in the three nativity-color groups. In the broad classification of native-white wives, the lowest birth rate was found among women who had entered college and in successive order were the rates for women of high school status, 8th grade, 7th grade, and under 7th grade (collectively). A matter of striking interest is the virtual absence of internal variations in birth rates among women who reported less than 7th grade attainment in school. Also, only a small disparity appeared to exist between the birth rates of wives of college and high school status, respectively.

In the main, the foregoing generalizations for the native whites appear to be substantiated in the analyses by area and size of city,

high birth rates shown for colored women on the Pacific Coast are doubtless due to the influence of Mexicans and yellow races. In Los Angeles, the only Pacific Coast city over 500,000 in the *Survey*, the enumerated colored females 15-44 years of age were distributed as follows: Negro, 23 per cent; Mexican, 59 per cent; "other," 18 per cent.

Figure 8. However, in the samples drawn from Pacific Coast cities and from one or two groups of smaller cities in other areas, there appeared to be virtual equality of birth rates among wives reporting college attendance, high school attendance, or 7th-8th grade status.

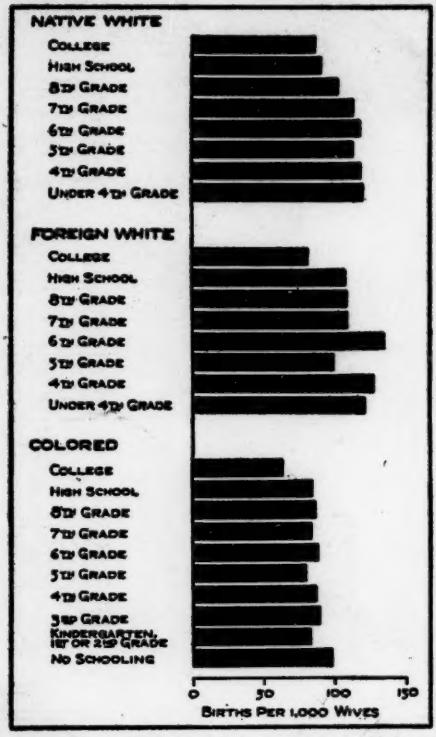


Fig. 7. Educational status in relation to birth rates in 1935 among wives 15-44 years of age, by nativity and color. Rates standardized for age and surveyed cities combined.

The gross average situation for foreign whites 15-44 years of age did not differ greatly from that described for the native-whites, Figure 7. The foreign-white married women reporting college attendance ranked lowest in birth rates, and those reporting less than 7th grade attainment collectively ranked highest in birth rates. Within the latter group, again, there appeared no indication of increased birth rates with lowered educational status.

Examination of the data for foreign-white wives by area and size of city, however, affords no basis for facile generalization on the question of the relation between birth rates and educational status of these women. Figure 9 presents the data for foreign-white wives 25-44 surveyed in cities of 100,000 population or more. The Eastern cities of 500,000 or more, represented by

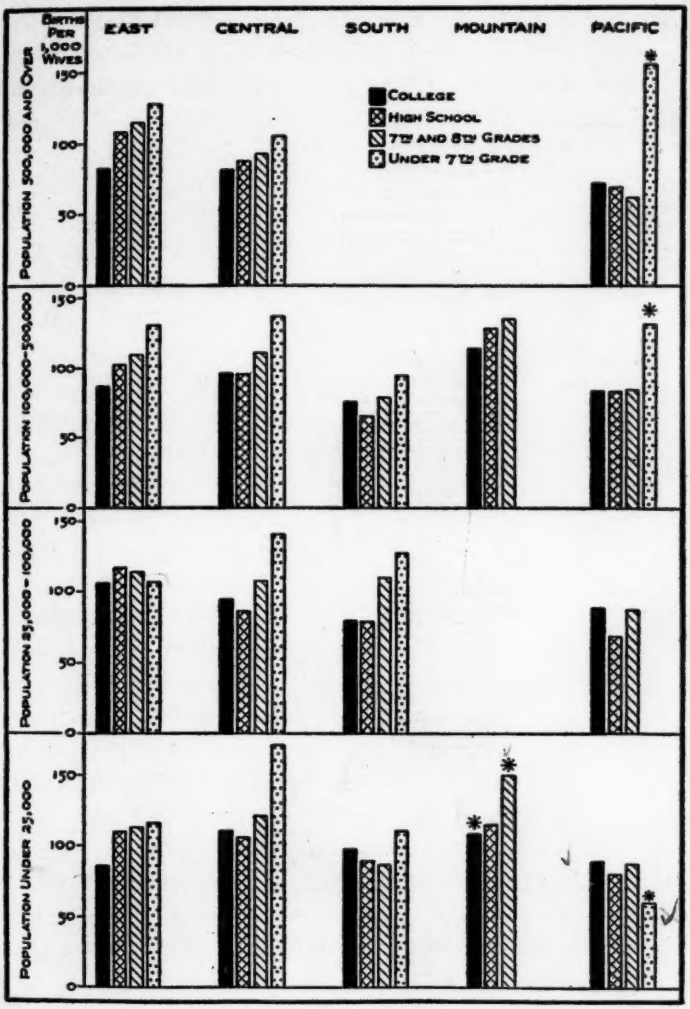


Fig. 8. Educational status in relation to birth rates in 1935 among native-white wives 15-44 years of age, by area and size of surveyed cities. Rates standardized for age.

practically 21,000 cases, exhibited a clear-cut case of negative correlation between birth rates and educational status. On the other hand, for Central cities of equal size (also represented by substantial numbers) almost the opposite result was secured. In remaining cities the variations of fertility with educational status were of small magnitude or based on too few cases to be of significance. In substance, the data yield no uniform picture of differences in birth rates by amount of schooling among foreign wives 25-44 years of age.

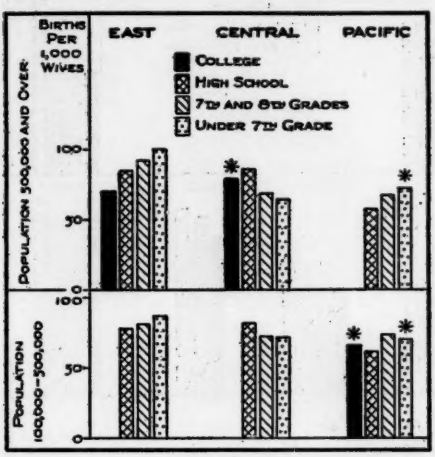


Fig. 9. Educational status in relation to birth rates in 1935 among foreign-white wives 25-44 years of age, in selected groups of surveyed cities. Rates standardized for age.

The combined data for urban colored wives in Figure 7 suggest that educational status has bearing on birth rates only in so far as extremes are concerned. The relatively few reporting college attendance were characterized by birth rates well below the level of those for women who did not report entrance into college. On the other hand, the rate for women reporting some high school training was almost as high as that for any lower group except the sheer illiterate, those reporting no schooling whatsoever.

When the classification by educational status of colored wives is made on a four-fold basis for the groupings by area and size of community, the lack of differentiation in fertility among women below the college level seems fairly consistent, Figure 10. The conspicuous exception is afforded by Los Angeles where the rate for

colored women of high school status was considerably lower than that for women who did not go beyond grammar school.

BIRTH RATES ACCORDING TO FAMILY INCOME

The foregoing sections have considered birth rates, first, in relation to an attribute of the husband, and next, in relation to an attribute of the wife. The family as a whole, however, is concerned in the analysis of birth rates according to the amount of income earned during the year preceding enumeration. Furthermore, in contrast to the rather stable nature of the two factors previously considered, especially educational status, family income is subject to change. It is of interest, therefore, to examine the relationship between birth rates and income status during an identical year, 1935.

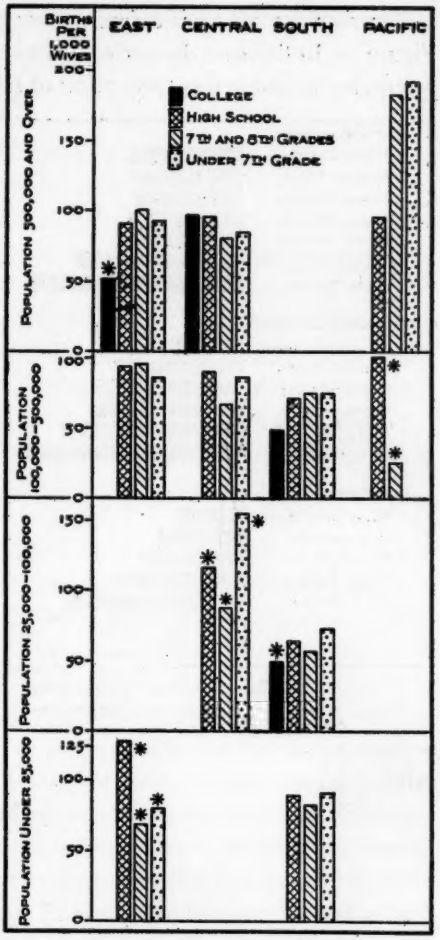


Fig. 10. Educational status in relation to birth rates in 1935 among colored wives 15-44 years of age, by area and size of surveyed cities. Rates standardized for age.

The data for all cities combined are presented, by nativity, in Figure 11. In this case the native whites could be classified into six groups by income status (regardless of relief status), ranging from "$5,000 and over" to "under $1,000 and total relief." Throughout the analysis, the data are also shown separately for families reporting the receipt of public relief[18] at some time during the twelve months preceding enumeration. Although the general picture is one of inverse association between birth rates and amount of income, this type of relation does not appear to extend into the upper income brackets. The birth rate for all native-white wives in families earning $5,000 and more was no lower than that for wives reporting family earnings of $3,000-$4,999 or $2,000-$2,999. On a straight income basis, the most conspicuous disparity in the birth rates of successive classes was that existing between the "$1,000-$1,499" and "under $1,000" group. The high birth rates among relief recipients,

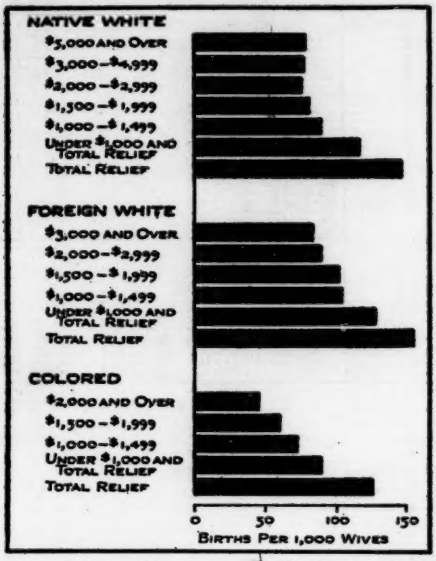


Fig. 11. Family income and birth rates in 1935 among wives 15-44 years of age, by nativity and color of the wife. Rates standardized for age and surveyed cities combined.

[18] Relief cases, regardless of income, were also included in the preceding category "under $1,000 and total relief." All families represented in higher income groups were nonrelief families because the negligible number of relief recipients reporting earnings of $1,000 or more were consolidated into one group by coding instructions. For the purpose of this analysis they were combined with families earning under $1,000. Native-white wives designated as relief recipients reporting family incomes of $1,000 or over constituted only 3 per cent of the cases in the category "under $1,000 and total relief." Corresponding rates were 3 per cent for the foreign whites and 1 per cent for the colored.

considered separately, was prominent, but this is due in part to the fact that indigent families with an expectant mother or a newly-born child are more likely to apply for and to receive public aid than are other poverty-stricken families.

The general picture described above appears to be borne out by the data given for native-white wives by broad region and size of community, Figure 12. When the material was thus broken down it was necessary to use "$3,000 and over" as the maximum income class, but the remaining groups are similar to those previously described. With one or two exceptions the birth rates among wives in families reporting $3,000 or over were about as high as or higher than those among wives reporting family earnings of $2,000-$2,999,[37] Figure 12. In fact, in most instances there appeared to be an absence of inverse association between birth rates and income among families earning more than $1,500 per year.

Limitations inherent in the problem preclude a satisfactory analysis of birth rates at the various income levels among the foreign-white and colored wives in the *Survey*. In the combined data for all cities the numbers were sufficient to establish a maximum income class of $3,000 and over for the foreign whites and $2,000 and over for the colored wives. The plotting of these data in Figure 11 yields a picture of straight inverse association between family income and fertility. The small number of foreign women under 25 years of age, the concentration of foreign-white and colored women in certain areas, and the predominance of colored wives in the lowest income brackets, diminished considerably the opportunity to secure further tests of the above situation.

The available birth rates for foreign-white women, 25-44 years of age, are shown by family income in Figure 13. As previously

[37] In the previously cited analysis of 1930 Census data for the East North Central States, Notestein found that except in rural farm areas, native-white families in homes valued at $10,000 or more were more fertile than those in residences valued at $5,000-$10,000. With this exception, fertility and value of home were inversely associated. (Fertility index used was mean number of resident children under 10 per wife married 5-9 years.) Notestein, F. W.: *op cit.*, pp. 186-191.

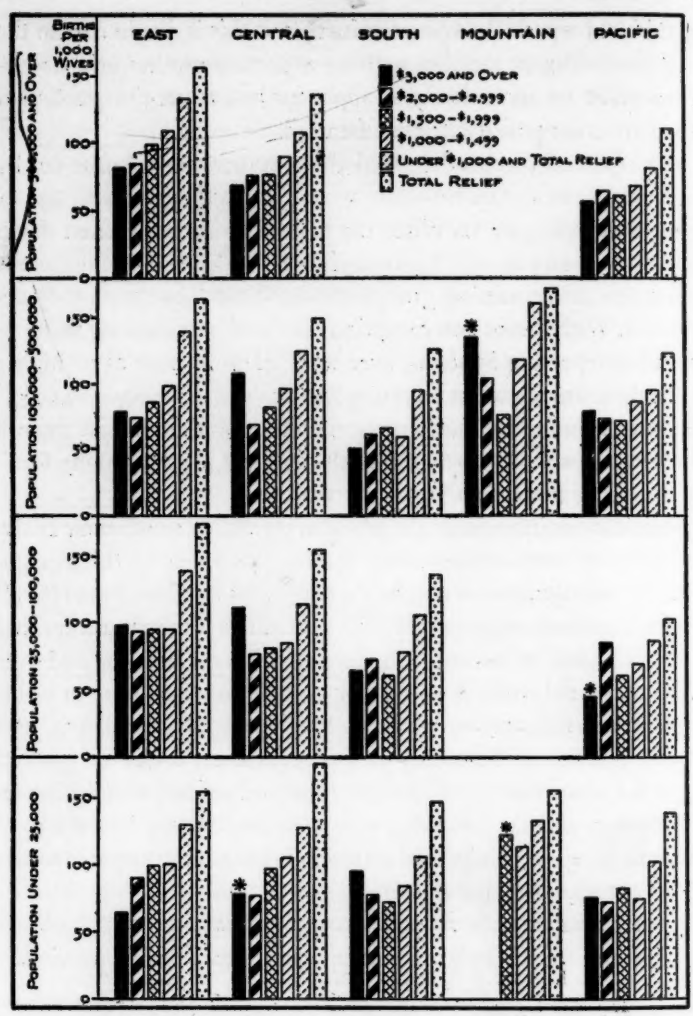


Fig. 12. Family income and birth rates in 1935 among native-white wives 15-44 years of age, by area and size of surveyed cities. Rates standardized for age.

observed with reference to educational status, the indications of

inverse association between birth rates and family income were most definitely manifested in Eastern cities of largest size. In the remaining groups of cities represented in the chart the above type of variation was only crudely shown or absent entirely.

In the classification of colored wives by area and size of community only a single subdivision was feasible on a straight family income basis.[18] As before, however, birth rates were also computed for recipients of relief, so the data in Figure 14 are shown for three designated groups. Birth rates among colored wives reporting family incomes of $1,000 and over were fairly consistently lower than those among wives in families earning under $1,000. Relief recipients, considered separately, generally ranked highest in birth rates. Within the narrow limits of income stratification represented in the *Survey*, therefore, the inverse association between family earnings and birth rates in the urban colored populations is clearly apparent.

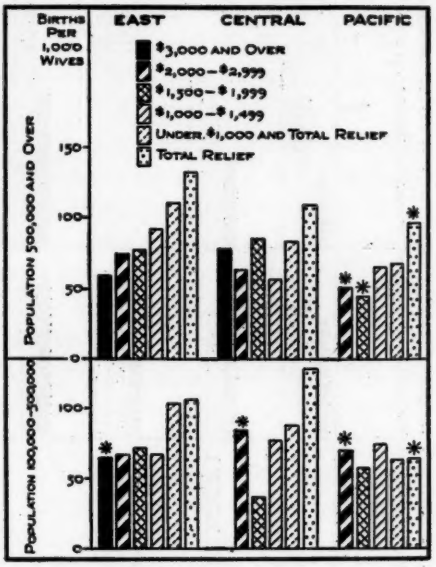


Fig. 13. Family income and birth rates in 1935 among foreign-white wives 25-44 years of age in selected groups of surveyed cities. Rates standardized for age.

SUMMARY AND CONCLUSION

In broad terms, the results described in this report would appear

[18] The class "under $1,000 and total relief" comprised 82 per cent of the colored wives considered in this fertility investigation as compared with 33 per cent of the native-white wives and 39 per cent of the foreign-white wives.

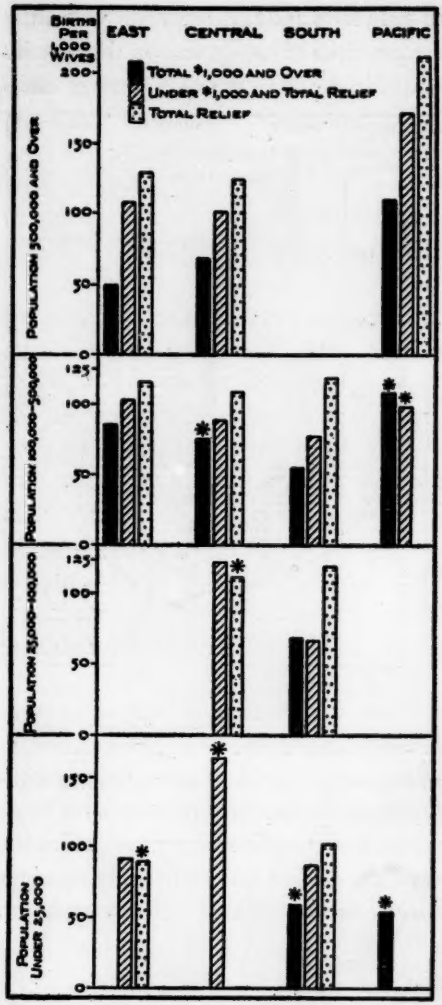


Fig. 14. Family income and birth rates in 1935 among colored wives 15-44 years of age, by area and size of surveyed cities. Rates standardized for age.

to substantiate other indications that group differences in the fertility of urban wives are becoming less important. Outstanding in this respect has been the trend toward equalization of birth rates among comparable groups of native-white and foreign-white married women.

Trends in the fertility of the various socio-economic classes cannot be so succinctly described until comparable data are available for time intervals. Nevertheless, the indications, in this and other investigations, of modifications in the traditional pattern of inverse association of birth rates with socio-economic status of urban native-white wives are suggestive of the diminishing importance of this type of relationship. The top classes in these groups were not universally characterized by

lowest birth rates. In some groups of cities, notably on the Pacific Coast where birth rates are extremely low, there was little or no indication of inverse association of birth rates with occupational status of the head or educational attainment of the wife. Among foreign-white and colored wives there seemed to be only crude or inconsistent patterns of variation of birth rates with occupational or educational status.

Such suggestive evidence of the diminishing importance of class differences in fertility is in line with the logic of the situation. If contraceptive practices originated among the upper classes in urban centers and have since tended to spread downward and outward, the process would yield first an enlargement and later a diminution of group differences in fertility. Innes'[19] recent analysis of data for England and Wales affords some indication that such has been the trend in those countries. During the last quarter of the Nineteenth Century there was unmistakable widening of class differences in fertility. There was at least suggestive evidence of a narrowing of class differences in birth rates in the city of London from 1931 to 1934. It may be, therefore, that important class differences in fertility, as we have known them in the past, constitute a transitory phase in a long period of declining fertility.

It should be emphasized, however, that whatever changes have occurred in differential fertility among urban native-white marriages, the wives in lowest income classes were generally and conspicuously most fertile. This held true even on the Pacific Coast. It should also be borne in mind that the present report has been confined to urban areas where the average reproduction rates are too low for population replacement, and has not taken into account the wide differences existing between the urban and the rural birth rates. Finally, it must be repeated that this is only a progress report of material under analysis and that the interpretations herein offered must be regarded as provisional.

[19] Innes, J. W.: CLASS FERTILITY TRENDS IN ENGLAND AND WALES, 1876-1934. Princeton, New Jersey, Princeton University Press, 1938, 152 pp.

BIRTH CONTROL IN A MIDWESTERN CITY

A STUDY OF THE CLINICS OF THE CINCINNATI COMMITTEE ON MATERNAL HEALTH

REGINE K. STIX, M.D.[1]

II. THE EFFECTIVENESS OF CONTRACEPTION AFTER CLINIC ATTENDANCE[2]

INTRODUCTION

WITHIN the past two or three years the prescription of contraception has been recognized by the federal courts and the organized medical profession[3] as a legitimate practice in the prevention of maternal morbidity and mortality. As a result, the extramural birth control clinic, of propaganda origin, is being gradually supplanted by the intramural hospital or public health clinic. This new type of clinic is primarily an agency for the care of patients who are referred by other clinics or physicians when, because of their health, pregnancy is temporarily or permanently contraindicated. If such clinics are to function efficiently, they must be planned and administered with a clear understanding of the problems involved in prescribing contraception for large groups of women, for many of whom accidental pregnancy may result in illness or death.

In a few forward-looking communities clinics were established under the direct supervision of local medical organizations prior to the court decision which did so much to clarify the status of contraception in the United States. One of the first of these was started by the Cincinnati Committee on Maternal Health in November,

[1] From the Milbank Memorial Fund.

[2] The first article in this series: Part I. "Contraception and Fertility before Clinic Attendance," was published in the Milbank Memorial Fund *Quarterly*, January, 1939, xvii, No. 1.

[3] Decision of the United States Circuit Court of Appeals, December, 1936. *Journal of the American Medical Association*, June 26, 1937, cviii, No. 26, pp. 2217-2218.

1929, in a local hospital, under the supervision of the Cincinnati Academy of Medicine. Since 1930, the Committee's clinics have been in charge of a medical director who is a member of the faculty of the University of Cincinnati College of Medicine and is responsible to the Academy for clinic policies and procedures. In addition to serving patients referred by physicians, other clinics, social service agencies, or clergymen, the clinics are used for the instruction of doctors and medical students in the techniques of contraception. Although not directly under the supervision of the local public health authorities, they have been established and run solely in the interest of the public health and welfare.

Early in 1935, the Milbank Memorial Fund was requested to make a follow-up study of the patients who had attended these clinics from their inception in November, 1929, to December 31, 1934. The study was undertaken with the realization that if contraceptive clinics are to be useful maternal health services, present procedures must be subjected to a more critical assessment than any previously made. A careful study of the acceptability of the methods usually prescribed, of their effectiveness as compared with other methods in general use, and of the effect of clinic attendance on the health and marital adjustment of the couples seeking advice is necessary before clinic procedures may be properly evaluated. A study of such complex problems must inevitably be incomplete, but it affords the possibility of reaching certain broad conclusions that may serve as a basis for more effective clinic administration in the future.

THE FERTILITY OF THE GROUP

Birth control clinics serve a selected group of highly fertile women. Many women are referred for special instruction in the techniques of contraception precisely because their pregnancies have occurred in such rapid succession that there has been no time for recovery from one pregnancy before the next was conceived. The

patients of the Cincinnati Maternal Health Clinics were much more fertile than a representative sample of native-white women[4] from comparable urban areas. No data were available for an unselected sample from Cincinnati but the clinic patients had almost twice as many live births per woman as a presumably representative group of married women living in Syracuse, New York, and a birth rate 66 per cent higher than that of a similar group in Columbus, Ohio.[5]

The mean number of births and pregnancies per woman among clinic patients, at the time of their first contact with the clinic, was strikingly similar to the birth and pregnancy rates of patients of other clinics with similar policies.[6] The patients of the Cincinnati clinics were more fertile than other urban women of comparable social status who had not necessarily attended birth control clinics, but no more fertile than women in other cities who had sought expert advice on contraception.

[4] Records were secured for white patients only. The socio-economic characteristics of the group are summarized in Table 14.

[5] The total live births per 100 women, standardized for age and occupational class, were as follows:

Patients of the Cincinnati Maternal Health Clinics	312.2
Columbus, Ohio, 1930*	188.4
Syracuse, New York, 1930*	160.5

*For a complete description of these two groups, *see* Notestein, F. W. and Kiser, C. V.: The Fertility of the Social Classes in the Native White Population of Columbus and Syracuse. *Human Biology*, December, 1934, vi, No. 4, p. 600.

[6] The mean numbers of pregnancies and live births per woman at the first contact with the clinic are compared below with those reported from other clinics.

Clinic	Mean Duration of Marriage	Pregnancies per Woman	Live Births per Woman
Cincinnati Committee on Maternal Health	8.8 years	4.04	3.31
Cleveland Maternal Health Clinic*	Under 10 years	4.04	3.34
Minnesota Birth Control League**	Unknown	4.20	3.46
Newark Maternal Health Center***	8.8 years	4.16	3.22

*Robishaw, Ruth: A Study of 4,000 Patients Admitted for Contraceptive Advice and Treatment. *American Journal of Obstetrics and Gynecology*, March, 1936, xxxi, No. 3.
**Abramson, Milton: A Study of 2,113 Cases Given Contraception at the Minnesota Birth Control League Clinic. *Journal-Lancet* (Minneapolis), August, 1936, lvi, No. 3, p. 446.
***Stone, Hannah M. and Hart, Henriette: Maternal Health and Contraception. Part I. Social Data. New Jersey Birth Control League, Newark, New Jersey, July, 1932.

THE RELIABILITY OF THE DATA

An adequate follow-up study of a group of clinic patients depends for its reliability on the quality of the data on which it is based. Sufficient time must have elapsed between the initial contact and the interview to assure an adequate test of the clinic's services, the recorded information must be accurate, and the sample of patients interviewed representative of the group which originally attended the clinic.

All but four of the patients interviewed had attended the clinic for the first time at least one year before the records were made. Fifty-five per cent of them had had at least three years of experience after their initial contact with the clinic. The mean length of time between clinic contact and interview was 40.7 months, a span which should assure an adequate test of the clinic's services. The information in the records is probably as accurate as any obtainable in a history.

It was impossible to obtain follow-up records from nearly 20 per cent of the women who originally attended the clinic, because they could not be found although exhaustive efforts were made to trace them. If the "lost" cases were different from those interviewed, a bias is introduced and the nature of the bias must be appraised.

Information concerning the "lost" cases was available from the records made when they first attended the clinic. This information is compared with similar data secured from the interviewed group at the time of the follow-up study in Table 14. The interviewed group did not differ from the original group in nativity, religion, or the usual occupation of the husband. It contained fewer families on relief and nonrelief families whose income was under $600 per year, than the original group. The data on income and housing are not strictly comparable in the two groups, since they were recorded in different years. Those for the "lost" cases were recorded in the years 1930-1934, while those for the interviewed cases were recorded in the years 1935-1937. Although the differences for the same years

	All Cases	Interviewed Cases (Data Recorded 1935–37)	Lost Cases (Data Recorded 1930–34)
Number of Women	2,023	1,621	402[1]
Descriptive Data			
Nativity			
Per Cent Native Born	94.6	94.0	97.0
Religion			
Per Cent Protestant	74.1	73.4	77.1
Occupation			
Per Cent Manual Workers	81.3	80.9	83.2
Skilled and Semi-Skilled	59.6	59.9	58.4
Unskilled	21.7	21.0	24.8
Income			
Per Cent on Relief	28.4	25.2	42.1
Nonrelief—Income Under $600 per Year	5.0	3.2	12.9
Housing			
Per Cent with 2 or More Persons per Room	36.7	33.3	52.0
Sanitary Facilities: Privy Only	8.8	10.0	2.6
Toilet Only	43.7	39.7	62.4
Fertility			
Mean Age at Marriage (Years)	19.7	19.8	19.4
Mean Duration of Marriage (Years)[2]	8.6	8.8	7.8
Mean Number of Pregnancies[2]	4.0	4.0	3.8
Mean Number of Live Births[2]	3.3	3.3	3.0
Case Status at Interview or End of Study			
Per Cent Active Cases[3]	45.8	53.0	16.7

[1]380 cases whose whereabouts were unknown, plus 22 cases who refused interview, or could not be interviewed because of language difficulty.
[2]At the first contact with the clinic.
[3]Clinic contact within 12 months of record.

Table 14. Comparison of lost and interviewed cases.

might be slightly greater or slightly less than those shown, the inference is clear that the families "lost" were mainly those living in crowded tenements who probably moved frequently because of in-

adequate resources. The fertility of the two groups was essentially the same.

The greatest difference between the "lost" and interviewed cases was in their case status at the time of record. Fifty-three per cent of the women interviewed had been in contact with the clinic within a year of the interview while less than 17 per cent of the "lost" cases were "active" at the termination of the present investigation.[7] It is not surprising that it was difficult to find those patients with whom the clinic had not recently been in contact and for whom no current address was available, but because of the loss of those women the interviewed sample is definitely biased in favor of cooperative clinic patients. Corrections can be made which will adjust both for this bias and for the possibility that the interviewed sample contains too few low-income families and families on relief.

THE METHODS OF CONTRACEPTION USED AFTER CLINIC ATTENDANCE

In the Cincinnati Maternal Health Clinics, as in most other birth control clinics in the United States, one type of contraception is prescribed almost exclusively. An occlusive rubber diaphragm together with a spermicidal jelly was prescribed for 98 per cent of the

Table 15. Proportion of women in each social class who never used clinically prescribed contraceptives, who used them for a time, and who were still using them at the time of investigation.

Social Class	Total Number	Per Cent of Women		
		Never Using CIB	Discontinuing CIB	Using CIB at Interview
All Women	1,621	2.6	51.4	46.0
Couples Not on Relief				
White-Collar Workers	266	1.5	42.9	55.6
Manual Workers	951	2.6	49.8	47.5
Couples on Relief	404	3.2	60.6	36.1

[7] Clinic records are automatically classed as "inactive" when there has been no contact of any kind with the patient in a period of one year.

patients,[8] on the assumption that this was the only method of contraception which was reliable as well as noninjurious.

Ninety-seven per cent of the women for whom the diaphragm and jelly were prescribed made some attempt to use them, but at the time the study was made only 46 per cent of those interviewed were still using the prescribed methods (Table 15). The wives of white-collar workers found the diaphragm more acceptable than the women in the other two groups. Only about one-third of the wives of relief recipients were using the clinic prescription at the time of the interview.

The proportion of women who originally attended the clinic who might be presumed to be using the diaphragm and jelly at the time of the follow-up study is even less, for as it has been shown, the interviewed sample is somewhat biased in favor of cooperative patients. Table 16 shows the proportion of interviewed patients who were using the prescribed contraceptives at the time of inter-

Table 16. Proportion of interviewed cases and estimated proportion of lost cases and all cases using clinically prescribed contraceptives at the time of investigation, by year of first contact.

Year of First Contact	Mean Number of Months between First Contact and Interview	All Cases		Interviewed Cases		Lost Cases	
		Total Number of Women	Estimated Per Cent Using at Interview[1]	Total Number of Women	Per Cent Using at Interview	Total Number of Women	Estimated Per Cent Using at Interview[1]
Total	40.7	2,023	39.7	1,621	46.0	402	14.8
1930	69.4	170[2]	24.7	126	31.0	44	6.1
1931	58.3	280	21.1	221	24.0	59	10.0
1932	46.5	431	36.0	336	42.6	95	13.1
1933	36.0	545	45.9	447	52.1	98	17.9
1934	25.8	597	49.9	491	56.6	106	19.7

[1]It was found that the women using the prescribed contraceptives at the time of the follow-up study were all active cases. The proportion of lost cases using the clinic prescription at the close of the study was estimated by applying to the active cases among those lost, the proportions of active cases among those observed, in each year, who were using the prescribed contraceptives at interview.

[2]Includes a few patients who came in the last two months of 1929.

[8]Two per cent were given the jelly alone because fitting with a diaphragm was impossible.

view and the proportion of all the patients who originally attended the clinic who might reasonably be expected to have been using them at a parallel time. Only about 40 per cent of all patients were probably using the prescribed contraceptives at the time of record.[9] As might be expected, the highest proportion of users occurred among the cases with the shortest experience, and the lowest proportion among those coming to the clinic in the first two years of its existence.[10]

The prescribed contraceptives were used for more than two-thirds of the total exposure to pregnancy which followed clinic attendance.[11] (Table 17.) For most of this exposure the clinic prescription was used as directed at the clinic. About 10 per cent of the women in the group alternated the use of the diaphragm and jelly with other types of contraception or used only part of the prescribed method during some part of the postclinic period. All irregular use of the prescribed methods was classified under one heading as "variants of the clinic prescription." The types of "variants" used differed in the three social classes. The alternate use of condom and diaphragm with jelly was the variant most frequently used by couples in the white-collar group. Among manual workers and relief recipients, the major proportion of couples using variants used the diaphragm without a lubricant, or with vaseline. The exposure with "variants" of the clinic prescription constituted only about 5 per cent of the total postclinic exposure to pregnancy (Table 17). The diaphragm and jelly were used in accordance with instructions for about 64 per cent of the total postclinic exposure. The proportion of exposure varied by social class, but even the wives of relief recipients, who used the prescribed contraceptives for a small-

[9] See footnote to Table 16 for the method of estimating this figure.

[10] The detailed discussion of the acceptability of the prescribed contraceptives will be undertaken in the third article of the series.

[11] Each woman was presumably exposed to the risk of pregnancy during those periods in which she was living with her husband and not pregnant, sterilized, or in the menopause. The exposures here presented are the aggregate exposures of all women in the sample whose exposure fell in each category.

Type of Exposure	All Couples	Couples Not on Relief		Couples on Relief
		White-Collar Workers	Manual Workers	
Total Exposure in Years	4,425.4	723.2	2,692.4	1,009.8
	PER CENT OF EXPOSURE			
No Contraception				
Habitual	1.8	0.7	1.7	2.9
Temporary[1]	0.5	1.1	0.5	0.1
All Contraception	97.7	98.2	97.8	97.0
All CIB	69.0	76.4	69.2	62.9
CIB[2]	63.7	70.8	63.6	58.9
Variants of CIB[3]	5.2	5.6	5.6	4.0
All Other Contraception	28.7	21.8	28.6	34.1
Condom	7.3	7.2	8.4	4.6
Coitus Interruptus	9.8	6.5	9.7	12.7
Douche	7.3	3.7	6.5	12.2
Other Types[4]	4.2	4.3	4.0	4.7

[1] Practice of contraception interrupted in order to permit pregnancy to occur.
[2] Used as prescribed.
[3] See page 159 for definition.
[4] Includes all alternations of methods, suppositories, sponge, etc.

Table 17. Proportion of exposure after clinic attendance, during which each type of contraception was used, and during which no contraception was used, by social class.

er proportion of the exposure after clinic attendance than did the women in either of the other groups, used the diaphragm and jelly, as directed, for nearly 60 per cent of their postclinic exposure.

Couples who discontinued the use of the prescribed methods turned to the types of contraception in general use before clinic attendance. Among couples who used contraceptives other than those prescribed, families on relief tended to use the least costly contraceptives, coitus interruptus and douche, for a large proportion of their exposure, while white-collar workers used condom for a larger proportion of their exposure than any other contraceptive except the ones prescribed by the clinic.

POSTCLINIC PREGNANCY RATES

Pregnancy rates with the prescribed contraceptives were very low, much lower than those for any type of contraception used

Period of Married Life	All Women	Couples Not on Relief		Couples on Relief
		White-Collar Workers	Manual Workers	
	Pregnancies per 100 years' exposure			
First Pregnancies	3	3	5	—[1]
All Later Pregnancies	9	6	8	15
Years Since Marriage				
0–4	12	10	9	28
5–9	9	3	8	16
10–14	8	8	7	10
15–29	8	4	8	11
	Number of years of exposure and number of pregnancies			
	Exp. / Preg.	Exp. / Preg.	Exp. / Preg.	Exp. / Preg.
First Pregnancies	116.1 / 4	72.8 / 2	40.2 / 2	3.1 / 0
All Later Pregnancies	2,703.1 / 244	439.4 / 25	1,672.2 / 133	591.5 / 86
Years Since Marriage				
0–4	442.7 / 54	94.0 / 9	273.2 / 24	75.4 / 21
5–9	935.7 / 82	179.5 / 5	571.9 / 47	184.3 / 30
10–14	713.6 / 58	118.0 / 9	428.6 / 32	167.0 / 17
15–29	611.1 / 50	47.9 / 2	398.4 / 30	164.7 / 18

[1] Insufficient exposure.

Table 18. Pregnancy rates with diaphragm and jelly, after clinic attendance, by social class.

preclinic.[12] The rates are shown in Table 18. The social class differentials were in the same direction as those usually observed in birth rates by social class but the rates of white-collar workers and those of manual workers showed no significant differences for the exposures during which the prescribed contraceptives were used. The rates of relief recipients, however, were significantly higher than those of either of the other groups.[13]

The pregnancy rates for "variants" of the clinic prescription were

[12] Part I, pp. 85-87, Tables 9 and 10.

[13] The significance of differences between the rates compared in the text was tested in each instance by means of the χ^2 test. This test is not ideally suited to the type of data here presented, but is the best approximation at present available. All statements that rates do not differ significantly are based on values of p that are .10 or larger. Statements that rates are significantly different are based on values of p that are .02 or smaller. In cases where differences are questionable, i.e., when values of p are greater than .02 but less than .10, the values of p are given in footnotes.

significantly higher than those for exposures with diaphragm and jelly used as prescribed, except in the case of white-collar workers, a large proportion of whom used the diaphragm and jelly alternately with condom (Table 19). Even though the exposure with "variants" of the prescribed contraceptives was relatively short, the inclusion of this experience with that during which the diaphragm and jelly were used in accordance with instructions yielded rates for all women which were slightly but consistently and significantly higher than those shown in Table 18 for women who used the diaphragm and jelly as prescribed. This difference demonstrates the importance of precise techniques in the use of any type of contraception.

Table 19. Total pregnancy rates with variants of the prescribed contraceptives, after clinic attendance, by social class.

Total	Couples Not on Relief				Couples on Relief	
	White-Collar Workers		Manual Workers			
PREGNANCIES PER 100 YEARS' EXPOSURE						
36	10		36		60	
NO. OF YEARS OF EXPOSURE AND NO. OF PREGNANCIES						
Exp.	Preg.	Exp.	Preg.	Exp.	Preg.	Exp.	Preg.
232.3	83	40.5	4	151.6	55	40.2	24

Pregnancy rates with types of contraception other than those prescribed are shown in Table 20. The rates with condom, after clinic attendance, did not differ significantly from those for diaphragm and jelly, in any of the social class groups. Rates for other types of contraception were somewhat higher. The social class differences in rates with each type of contraception were small and of doubtful significance. They might have been more significant had the experience been greater.[14] The rates for all contraception other

[14] The observed values of p were as follows:

Condom:
- White-collar workers and relief recipients, p was between .05 and .10
- Other comparisons showed no significant differences.

Coitus Interruptus:
- White-collar workers and manual workers, p was between .05 and .10
- Manual workers and relief recipients, p was between .05 and .10
- White-collar workers and relief recipients, $p > .01$

Douche:
- White-collar workers and manual workers, p was between .05 and .10
- Manual workers and relief recipients, p was between .10 and .20

Type of Contraception	Total Pregnancies per 100 Years' Exposure[1]							
	All Couples		Couples Not on Relief				Couples on Relief	
			White-Collar Workers		Manual Workers			
All Contraception	28		16		27		36	
Condom	10		6		9		17	
Coitus Interruptus	38		24		37		47	
Douche	36		30		40		31	
Other Types[2]	21		10		18		38	
	Number of Years of Exposure and Number of Pregnancies							
	Exp.	Preg.	Exp.	Preg.	Exp.	Preg.	Exp.	Preg.
All Contraception	1,270.8	355	157.5	25	768.9	206	344.4	124
Condom	324.6	32	52.4	3	226.0	21	46.2	8
Coitus Interruptus	435.2	167	46.7	11	260.5	96	128.0	60
Douche	324.3	116	27.1	8	174.5	70	122.7	38
Other Types[2]	186.7	40	31.2	3	107.9	19	47.5	18

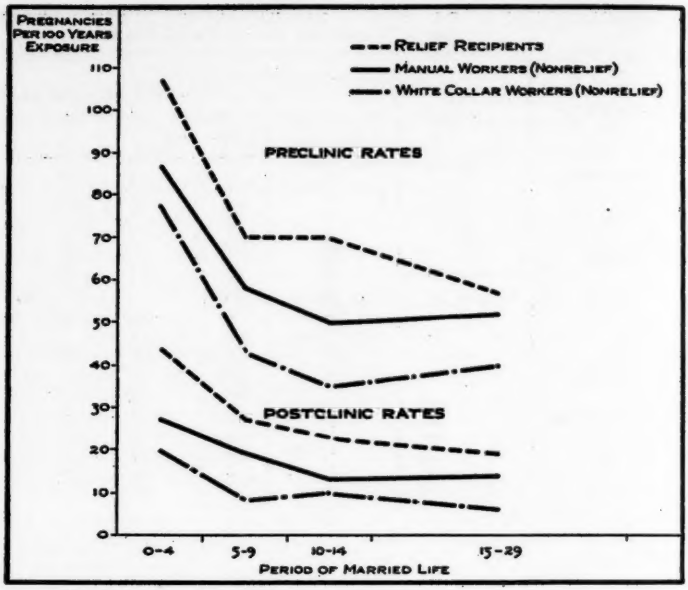
[1]Standardization does not affect the rates.
[2]Includes all alternations of methods, suppositories, sponge, etc.

Table 20. Pregnancy rates for contraceptives other than those prescribed, after clinic attendance.

than that prescribed at the clinic were significantly lower for white-collar workers than for manual workers, and significantly lower for manual workers than for relief recipients. Correction of rates for all contraception because of possible bias due to the slightly low proportion of couples on relief in the interviewed as compared with the original sample did not change the rates significantly. The social class differentials observed in the total rates preclinic were maintained in the total rates postclinic, although all rates were at a lower level (Fig. 7).[15] The differentials were due mainly to differences in the prevalence of the less effective types of contraception.

Pregnancy rates with each type of contraception were only about half as high after clinic attendance as they had been before (Fig. 8). It is difficult to determine just why this should happen, though a

[15] These rates include exposure with and without contraceptives.



[1]Includes exposure with and without contraceptives.

Fig. 7. Pregnancy rates for total exposure,[1] in each period of married life, before and after clinic attendance.

similar observation was made in the case of patients of a New York birth control clinic.[18]

It is possible that those couples who used contraception other than that prescribed by the clinic were mainly couples who had previously found those types of contraception satisfactory. There was a marked tendency for couples who did not use the clinic prescription or who discontinued its use to turn to the same types of contraception they had used before they attended the clinic (Table 21). Between one-third and one-fourth of all the couples who had used contraception before coming to the clinic used the same method or methods after attending the clinic that they had used before. The question arises whether those couples whose use

[18] Unpublished data from the Milbank Memorial Fund.

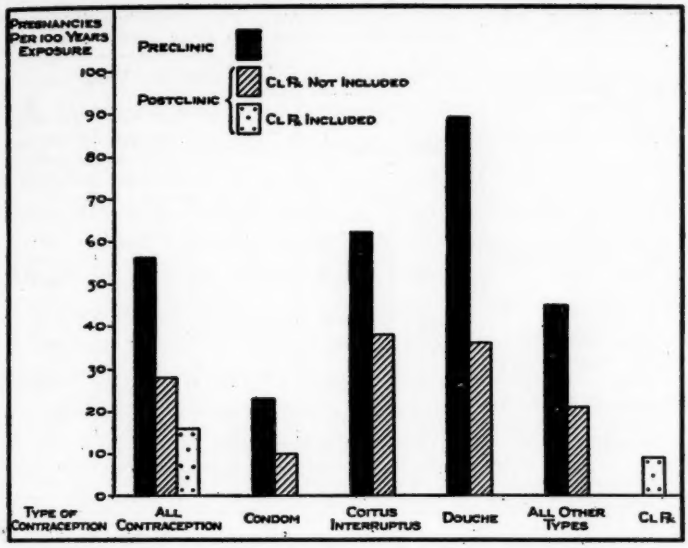


Fig. 8. Pregnancy rates with specified types of contraception before and after clinic attendance.

of a contraceptive preclinic was conspicuously successful were the ones to continue to use it or to return to it after they attended the clinic. No significant differences were demonstrable in the preclinic rates of couples who used the same method postclinic and of those who turned to other methods, except in the case of those who used douche. The preclinic rates of couples who continued to use douche after they attended the clinic were significantly lower than those of couples who turned from douche to other types of contraception.[17] There were 54 women who never used clinically prescribed contraceptives after they attended the clinic, but who used

[17] The total preclinic rates for each type of contraception, standardized by duration of marriage, were as follows:

	Condom	*Coitus Interruptus*	*Douche*
Couples using same contraceptive postclinic	21	69	83
Couples using other types of contraception postclinic	23	64	91

Type of Contraception Used Before Clinic Attendance	Type of Contraception Used After Clinic Attendance				
	All Couples		Per Cent Using		
	Number	Per Cent	CIB Only	Same Contraceptive as Used Preclinic[1]	All Other Types and Combinations[1]
All Contraception	1,453[2]	100.0	53.0	27.5	19.5
Condom Only	172	100.0	50.0	28.5	21.5
Coitus Interruptus Only	233	100.1	46.4	31.8	21.9
Douche Only	196	100.0	35.2	34.7	30.1
Condom or Coitus Interruptus	233	100.0	57.9	36.9	5.2
Condom or Douche	135	100.0	51.1	26.7	22.2
Coitus Interruptus or Douche	127	100.0	49.6	36.2	14.2
Condom or Coitus Interruptus or Douche	107	100.0	60.7	37.4	1.9
All Others	250	100.0	70.0	30.0	

[1]Many of these used CIB for a time, and later turned to the use of the other methods.
[2]Total using contraception both before and after clinic contact. 141 couples used none before they attended the clinic, and 27 couples had no exposure or used no contraception after they attended the clinic.

Table 21. Distribution of couples using each contraceptive method before attendance at the clinic by type of contraception used after clinic attendance.

other types of contraception with complete success. These women had preclinic pregnancy rates with contraception that were significantly lower than those of all other women in the group.

The drop in rates postclinic must be attributed mainly to factors other than selection, though selection may be a factor for part of the group. It is possible that the rise in the abortion rate immediately preceding their attendance at the clinic[18] was an indication that some couples considered their families complete and came to the clinic because they were determined to have no more children. Such couples would doubtless practice any contraception more diligently because of that determination. It is possible also that what they learned at the clinic concerning their own anatomy and the technique of douching may have helped to make all contraception more effective, regardless of the type used.

[18] Part I, pp. 89-90.

THE EFFECTIVENESS OF CONTRACEPTION AFTER CLINIC ATTENDANCE

In measuring the effectiveness of clinically prescribed contraceptives, it is necessary to depart from the methods used in earlier clinic reports. In most clinic studies the percentage of "successes," or the proportion of women using a given contraceptive who had no accidental pregnancies while using it, has been employed as the measure of effectiveness of that contraceptive. Comparison of the proportion of "failures" with the contraceptives prescribed at the clinic and the proportion of "failures" with other types of contraception, based on their use before clinic attendance, yields wide differences in the per cent of "success" of the pre- and postclinic methods.[19]

In almost every instance the exposure to the risk of pregnancy with contraceptives, prior to attendance at the clinic, is much longer than that following clinical instruction. The period between marriage and the first contact with a birth control clinic is usually sufficiently long to give virtually every patient the opportunity to become pregnant once and most patients the opportunity to become pregnant several times. In the postclinic period covered by the usual follow-up study, the elapsed time is so short that many patients would not have become pregnant even though they had used no contraception, some might have become pregnant once, and very few could have become pregnant more than once, under any circumstances. For these reasons the proportion of women "failing," i.e., having accidental pregnancies, in the long period before their contact with the clinic must perforce be much higher than the proportion "failing" in the short period following clinic contact, even though the contraceptives used in both periods were equally effective.

With the computation of pregnancy rates based on exposure to

[19] *See* Kopp, Marie: BIRTH CONTROL IN PRACTICE. New York, Robert McBride and Co., 1934, Tables 42 and 72.

Stone, Hannah: Maternal Health and Contraception. *Medical Journal and Record*, May 3, 1933, Tables III and V.

the risk of pregnancy, a concept first introduced by Pearl,[20] it becomes possible to measure the effectiveness of a given contraceptive in terms of its prevention of pregnancies which would have been expected had no contraception been used for an equivalent exposure. Thus, the comparison of the effectiveness of different types of contraception may be made with the knowledge that the effectiveness ratios are based on the same noncontraceptive rates and the same units of time.

The effectiveness of a contraceptive is measured in terms of its prevention of the pregnancies that would have occurred had no contraception been used for the same length and distribution of exposure. The product of the exposure with the contraceptive, and the pregnancy rate observed in each period of married life when no contraception was used, yields the number of pregnancies expected in each period of married life if no contraception had been used for an exposure of equal length. The difference between the sum of the expected pregnancies in all durations of married life and the sum of all the pregnancies observed when the given contraceptive was used is an estimate of the number of pregnancies prevented by the use of that contraceptive. The ratio of observed pregnancies to those prevented yields the per cent of effectiveness of the contraceptive.

The effectiveness of diaphragm and jelly, as used by all the women who ever used the prescribed methods, ranged between 95 per cent for white-collar workers and 82 per cent for relief recipients (Table 22). For those women who used the prescribed contraceptives continuously, and according to instructions, the effectiveness ratios were somewhat higher. Condom was as effective as the most effective use of diaphragm and jelly. Even those contraceptives thought to be relatively unreliable showed a surprising degree of effectiveness when used by white-collar workers. It is probable that

[20] Pearl, Raymond: Contraception and Fertility in 2,000 Women. *Human Biology*, September, 1932, iv, No. 3, p. 400.

the effectiveness of such contraceptives can be greatly increased by diligence and care in their use. All contraception was 85 per cent effective after clinic attendance.

The large proportion of couples who gave up the diaphragm and jelly, as well as the relatively high effectiveness of the contraception not prescribed by the clinic, suggest that unless there are cogent reasons aside from effectiveness for prescribing only one type of contraception, several types should be prescribed. A single contraceptive is unlikely to be equally acceptable to all types of people, for the choice of a contraceptive is a highly individual problem. Moreover, careful instruction in the best use of any contraceptive would probably increase its effectiveness. It would be far wiser to prescribe for each couple the type of contraception best suited to that couple's tastes and needs, and to instruct them in the most effective way to use that method, than to assume that all couples will accept one type of contraception with equal enthusiasm.

Table 22. Per cent of effectiveness of each type of contraception as used by three social classes before and after clinic attendance.[1]

Type of Contraception	All Couples		Couples Not on Relief				Couples on Relief	
			White-Collar Workers		Manual Workers			
	Pre-clinic	Post-clinic	Pre-clinic	Post-clinic	Pre-clinic	Post-clinic	Pre-clinic	Post-clinic
All Contraception	52	85	64	93	54	85	38	76
All Cl B	—	90	—	95	—	90	—	82
Diaphragm and Jelly	—	92	—	96	—	92	—	85
Variants of Cl B	—	64	—	91	—	62	—	35
All Contraception Except Cl B	52	72	64	86	54	73	38	63
Condom	81	91	88	95	82	91	65	85
Coitus Interruptus	45	62	52	80	47	64	37	52
Douche	25	63	16	71	28	59	23	68
Other Types	61	78	70	91	63	82	47	57

[1]Ratio of pregnancies prevented to those expected had no contraception been used. (For further explanation see Part I—pp. 83 and 84, and footnote 1—Table 11.)

SUMMARY

A group of patients who attended the clinics of the Cincinnati Committee on Maternal Health between November, 1929, and December 31, 1934, were interviewed in their homes between April, 1935 and April, 1937. The patients interviewed constituted about 80 per cent of the group who had originally attended the clinic, and were somewhat more cooperative than those who could not be traced.

An occlusive rubber diaphragm and spermicidal jelly were prescribed for 98 per cent of the women who sought contraceptive advice at the clinic. About 45 per cent of those interviewed and an estimated 40 per cent of the original group were using the prescribed contraceptives at the time of the follow-up study, which covered a mean interval of about 40 months between the initial clinic contact and the interview.

Pregnancy rates with diaphragm and jelly were very much lower than any rates with contraception before attendance at the clinic. Rates of self-supporting workers were significantly lower with the prescribed contraceptives than the rates of relief recipients.

Couples who did not use the prescribed contraceptives or discontinued them turned to the types of contraception in general use before they came to the clinic. Pregnancy rates with each type of contraception were very much lower after the women had attended the clinic than before. While rates for individual contraceptives did not differ greatly in the three social classes, the social class differentials observed before clinic attendance were maintained at a lower level after the women had been to the clinic because white-collar workers used mainly the most effective types of contraception, manual workers fairly effective types, and relief recipients those contraceptives which were least effective.

All contraception, after clinic attendance, was 85 per cent effective in preventing pregnancies that would have been expected had no contraception been used. The contraception used by white-

collar workers was 93 per cent effective; that used by manual workers 85 per cent effective, and that used by relief recipients 76 per cent effective.

The rejection of the single contraceptive prescribed at the clinic, by more than half of the women who applied for advice, together with the relatively high effectiveness of contraceptives other than those prescribed, leads to the conclusion that clinics should prescribe a number of different kinds of contraception, suiting each to the needs of the individual couple.

MATERNAL HEALTH AND SUPERVISION IN A RURAL AREA

DOROTHY G. WIEHL AND KATHARINE BERRY[1]

THE problem of maternal care was recognized as a difficult but important one in the development of a broad health program in Cattaraugus County, New York, where a rural health demonstration was begun in 1923. However, little experience with the provision of public health services to give more adequate protection to mothers was available from other rural communities and, in the early years of the demonstration, chief emphasis was given to the application of proven health measures, such as those for tuberculosis control and health instruction for care of infants. Studies of infant mortality in the County soon showed that reduction of the infant death rate, as well as the protection of the mother's health, would require an intensive health program directed to the improvement of maternal care. In 1926 and 1927, resident infant mortality in the rural part of the County averaged 53.5 per 1,000 live births[2] and nearly 80 per cent of the deaths resulted from childbirth or congenital and other "early infancy" conditions, the most important of which was premature birth. Such data gave striking evidence of the need for more effective health services for the care of mothers during pregnancy and for early care of the newborn infant. Fundamental to plans for meeting this need was the accumulation of more information on the amount and type of care being received and the use of available services.

An opportunity for obtaining detailed information on the health supervision received by rural mothers and their infants was afford-

[1] From the Milbank Memorial Fund in cooperation with Statistical Studies, Division of Public Health Methods, National Institute of Health.

[2] Wiehl, D. G.: Correction of Infant Mortality Rates for Residence. *American Journal of Public Health*, May, 1929, xix, No. 5, pp. 495-510. Infant mortality in rural Cattaraugus County was higher for several years following 1926 and 1927, but corrected resident rates for the rural area by cause of death are not available until 1933.

ed by a special morbidity survey conducted in Cattaraugus County by the United States Public Health Service and the Milbank Memorial Fund, with the cooperation of the County Department of Health. During the period from September, 1929, to June, 1932, nearly all families living in five townships in the central part of the County were visited fairly regularly at intervals of about three months to inquire about any illnesses in the family and to obtain data about medical care and other health supervision received. Confinements are normally reported as an illness in morbidity surveys, but in the present survey a special questionnaire was provided the enumerators who asked specifically for information about prenatal health and medical or nursing supervision as soon as it became known that the wife, or other member of the family, was pregnant. Similarly, a special record was obtained, usually from the mother herself, for details of her delivery and postpartum health and care, and for each live-born baby special data were obtained throughout the period of infancy. Thus, the antepartum and postpartum records available for the present report include not only histories of mothers who were under medical care but also of those who had no supervision.

During the period of observation for the survey, 213 women reported one pregnancy, 45 women two, and 3 women three, making a total of 312 pregnancies included in the study. Two hundred and seventy-eight of these terminated in live births, five of which were multiple, 13 in stillbirths, and 21 in abortions.[3] Ten live births and three stillbirths were delivered before the ninth month of gestation,[4] making a total of 34 pregnancies which terminated prematurely.

[3] Any product of pregnancy of less than 27 weeks or 7 months' gestation was considered an abortion unless it was registered as a live birth.

[4] The frequency of premature births in this series was 4.4 per 100 births, excluding abortions, compared with 5.5 per 100 in New York State, exclusive of New York City, in 1936, as reported by J. Yerushalmy. *See* Neonatal Mortality by Order of Birth and Age of Parents. *American Journal of Hygiene*, September, 1938, xxviii, No. 2, p. 253. However, registered stillbirths of only 5 or 6 months' gestation are included in the New York State total, and some live births less than one month premature would be registered as premature births.

The stillbirth rate of 41.7 per thousand total births during the study is very much higher than the average resident stillbirth rate of 32.2 in rural Cattaraugus County for the years 1930-1931, the two calendar years which were included in full in the survey period. However, if the number of births registered in the five townships in this survey, according to the *Vital Statistics Reports of the New York State Department of Health* for 1930 and 1931, is corrected by adding the survey births reported as delivered outside the area in these two years, the stillbirth rate for the area is 54.5 compared with a rate of 55.8 for the same period in the survey.[5] The high stillbirth rate among the survey births, therefore, was typical of this particular section of Cattaraugus County, at least during these years.

Deaths from early infancy conditions among the survey births gave a rate of 31.8 per 1,000 which was lower than the mortality from these causes for the County, exclusive of Olean and Salamanca.[6] If the stillbirths and deaths from causes associated with early infancy are combined, the loss from prenatal, natal, and neonatal causes in the five towns during the survey period was practically the same as in the rural part of the County.

Health Facilities in the Area. Three physicians lived in the small village within the survey area and many others were available in nearby villages and in Salamanca, a city of approximately 10,000 population, which borders the area on the south. No family lived more than ten miles from a physician. There is a hospital in Sala-

[5]

	Years 1930-1931		
	Total Number of Births	*Number of Stillbirths*	*Stillbirth Rate*
Survey in 5 townships	215	12	55.8
Reported born outside the townships	20	3	—
Registered in 5 townships (State Report—Vital Statistics)	200	9	45.0
Registered + births outside the 5 townships	220	12	54.5

[6] The mortality from early infancy causes in the years 1930 and 1931 was 40.5 per 1,000 live births for the County, exclusive of Olean and Salamanca, when births and infant deaths *registered in the County* are allocated to place of residence.

manca and one in Gowanda, not far from the northern part of the area, but neither hospital maintained any maternal clinics or free beds for delivery service. There was also a small maternity home in the one village within the area.

The full-time medical director of the Bureau of Maternal, Infant and Child Hygiene, who had served for three years, resigned in August, 1929, and this position was not filled until June, 1931. For this reason, throughout most of the survey period, the public health nurses on the staff of the County Department of Health gave the only services provided by the Department of Health. The survey area included parts of two of the six nursing districts in the County, exclusive of Olean City which was not served by the County nurses. There was one nurse to about 3,500 population in the first year of the survey, but this ratio changed to one nurse to about 4,500 population as a result of a reduction in the number of staff nurses in the summer of 1930. The prenatal service provided was almost entirely educational visits to the home, as neither Mothers' Clubs nor prenatal clinics were held. The nurses did not take blood pressure readings nor do urinalyses, as these services had not been approved by the County Medical Society, but they sometimes collected urine specimens to take to the physician. Nursing assistance at delivery was given when requested by the physician, and postpartum bedside care also was given until someone in the home was trained to continue care of the patient.

The attention given to the maternal health problem by the nurses, who were providing a generalized nursing program, was affected not only by the number of nurses on duty and the demands for other health services but also by the interest in the problem which may be stimulated by a director or other responsible officer directing a special program. This is evident in the annual variations in nursing visits to maternity cases. In 1926, only 8 per cent of home visits by nurses were to maternity patients but in 1927, the first year for which there was a full-time medical director, 12 per cent of the

visits were to maternity patients. In 1930 and 1931, when there was no medical director to promote and guide the maternal program, the per cent of all home visits which were maternity visits was 8 and 9, respectively, but increased again to 13 per cent in 1932.

In the last twelve months of the survey period, the director of the Bureau of Maternal, Infant and Child Hygiene started a special prenatal service for low-income patients whereby the private physician was paid by the Health Department for prenatal care given in his own office. A nurse investigated the economic condition of the patient and, if the family was unable to pay, the Health Department forwarded a request for further medical care to the Welfare Department.[7] The authorization for confinement care was solely the responsibility of local welfare officers.

PRENATAL CARE

Medical Care. The data obtained concerning medical care in the prenatal period were entirely quantitative and relate to the number of times the patient visited or was visited by a physician, the month of pregnancy in which the visits were made, and the number of urinalyses made. Such data do not reveal the quality or adequacy of the supervision given, but are an index of the opportunity for good supervision and of the attitude toward prenatal care of these rural women. The record of prenatal care was not complete for a number of cases, especially for pregnancies which terminated in abortions. All abortion cases, therefore, are omitted from many of the tables showing the extent of prenatal care.

The number and per cent of maternity patients in the series who reported specifically that no visit was made to a physician before delivery is shown in Table 1. The 62 patients with no prenatal care were 21 per cent of the total reporting on care. The number of cases terminated before the ninth month of pregnancy was small, but it

[7] *See* Bell, J. Warren, M.D. and Atwater, Reginald M., M.D.: Providing Prenatal Care for Necessitous Women. The Milbank Memorial Fund *Quarterly*, April, 1935, xiii, No. 2, pp. 179-184.

Period of Gestation at Delivery	Total Pregnancies in Survey	Prenatal Care				
		Total Known	Number		Per Cent	
			One Visit or More	None	One Visit or More	None
Total Maternity Cases	312	296	234	62	79.1	20.9
9th Month	276	272	219	53	80.5	19.5
7th–8th Months	13	12	8	4	66.7	33.3
6th Month or Earlier	21	12	7	5	58.3	41.7
Unknown	2					

Table 1. Proportion of maternity cases for which some prenatal care by a physician was reported in a special survey of rural women in Cattaraugus County, New York, in the period September, 1929, to June, 1932.

is apparent that a larger percentage of such cases than of births at term had no medical care before confinement. This is to be expected unless most patients make a first contact with their physician early in pregnancy.

Registration with a physician during the first trimester of pregnancy was reported by 30.8 per cent of the women, as shown in Table 2, and another 19.2 per cent registered in the fourth or fifth months. Half of the women, therefore, had seen a physician early

Table 2. Month of pregnancy in which a physician was first visited by maternity patients in rural Cattaraugus County, New York, as reported in a special survey from September, 1929, to June, 1932.

Month of Pregnancy at which Prenatal Care Began	Number of Women Classified According to Time of Termination			Per Cent of Women Classified According to Time of Termination		
	Total	Ninth Month	Eighth Month or Earlier	Total	Ninth Month	Eighth Month or Earlier
Total[1]	292	268	24	100.0	100.0	100.0
1st–3rd Months	90	80	10	30.8	29.9	41.7
4th–5th Months	56	53	3	19.2	19.8	12.5
6th–7th Months	57	55	2	19.5	20.5	8.3
8th Month	19	19		6.5	7.1	
9th Month	8	8		2.7	3.0	
No Medical Care	62	53	9	21.2	19.8	37.5

[1]Excludes 4 cases with care for which month of first visit was unknown.

enough in pregnancy to receive reasonably good supervision. The cumulative percentages of patients who had made at least one prenatal visit to a physician by the end of any specified month of pregnancy is shown in Figure 1 which indicates a fairly regular increase in medical attendance up to the last two months. Data in Table 2 on prenatal care for women whose pregnancies terminated early suggest that a relatively high percentage of them received some prenatal care in the first trimester of pregnancy. This group apparently either sought medical advice early in pregnancy, perhaps because of symptoms or some previous experience, or postponed registering with the physician until so late that when early termination occurred no contact with a physician had been established.

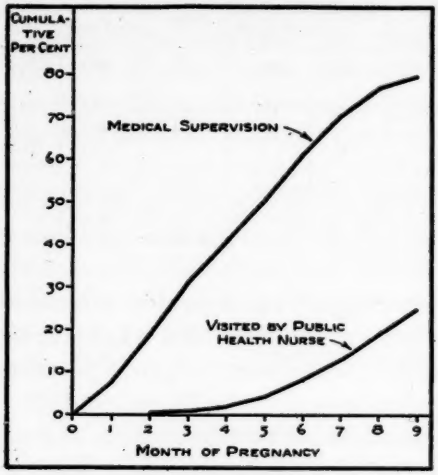


Fig. 1. Cumulative percentages of maternity cases under medical supervision and under nursing supervision at the end of each month of pregnancy, according to a special survey in Cattaraugus County, New York, 1929-1932.

Although effective prenatal supervision requires repeated visits to the physician, revisits to the physician at regular intervals were made by only a small percentage of these rural women. Women who made only one visit for prenatal care before confinement were nearly as numerous as those who had no care, and about 40 per cent of the total series either had no care or made only one visit. In Table 3, the number of physician calls for prenatal supervision is shown in relation to the month of pregnancy at first visit to the physician. Mothers who delivered prematurely are excluded since

premature termination reduces the time period during which visits could be made. Early registration with the physician was no indication that the patient would make the necessary return visits. Half of the women (50.6 per cent) who registered with a physician before the fourth month of pregnancy made as many as seven visits, or the minimum number required for regular monthly visits until delivery; but 5 per cent of them did not return for supervision after seeing the physician once and 14 per cent made only two or three visits. The proportion of women visiting with any degree of regularity was less among those who registered later in pregnancy, and of those who first saw a physician in the sixth or seventh month of pregnancy, about one-third made no additional visits. Obviously, many opportunities for adequate prenatal care were missed. The physician, even though he may have seen the mother early in pregnancy, either failed to stress the need for regular supervision, or he was unable to change an attitude prevalent in rural sections, that a doctor's services are needed only in case of actual illness.

The information collected on the number of urinalyses that were made indicated that it was the general practice of the physicians to make such an analysis each time the patient was seen. For some patients, specimens were taken to the physician for analysis when

Table 3. Number of prenatal visits to physician according to month of pregnancy at which care began for women with term births as reported in a special survey in rural Cattaraugus County, New York, from September, 1929, to June, 1932.

Month of Pregnancy at which Prenatal Care Began	No. of Women	No. of Women Who Made Specified No. of Visits				Total	Per Cent of Women Who Made Specified No. of Visits			
		1	2–3	4–6	7 or More		1	2–3	4–6	7 or More
Birth at Term	211[1]	47	56	63	45	100.0	22.3	26.5	29.9	21.3
1st–3rd	77	4	11	23	39	100.0	5.2	14.3	29.9	50.6
4th–5th	53	6	17	25	5	100.0	11.3	32.1	47.2	9.4
6th–7th	54	18	21	14	1	100.0	33.3	38.9	25.9	1.9
8th–9th	27	19	7	1		100.0	70.4	25.9	3.7	

[1] 219 women were reported as receiving some care, but for 4 the month care started was unknown, and for 4 the number of visits made was unknown; they, therefore, are excluded.

no prenatal visit was made, and two women who did not see a physician before confinement had had an analysis of a urine specimen. Nevertheless, among women who had visited a physician in the prenatal period, 19 per cent had had no urinalysis and 9 per cent had had only one specimen tested.

Prenatal Nursing Supervision. The prenatal visits of the public health nurse provide an important supplement to the medical supervision received by rural mothers. In some instances, the nurse discovers the prenatal case while visiting the family for other health supervision and is instrumental in getting the woman to call upon her family physician. In all cases, the nurse seeks to have the patient continue regular visits to her physician and, although her function is chiefly educational, she also watches carefully for signs or symptoms of any abnormal condition which should be reported to the physician.

A public health nurse had made at least one prenatal visit to 83 of the maternity cases in this series, or 26.6 per cent of all cases. Approximately the same percentage of cases (24.0) with prenatal nursing service was reported by Randall[8] in a study of maternity nursing service in 1930 in three nursing districts in Cattaraugus County. The month of pregnancy in which the nurse made her first visit is shown in Table 4, and the cumulative percentage of cases visited by the end of each month is indicated in Figure 1. Only 8 per cent of the total group (one-third of those receiving nursing visits) were visited in the sixth month or earlier, and, consequently, few women received early instruction in the hygiene of pregnancy and there was limited opportunity for preventive supervision.

Physicians in the area apparently failed to appreciate the value of the service which the nurses could render prenatal patients, since so few of the women who registered with their physician early also had been visited by the nurse early in pregnancy. The number of

[8] Randall, Marian G.: Maternity Service by the Rural Public Health Nurse. Milbank Memorial Fund *Quarterly Bulletin*, July, 1931, ix, No. 3, pp. 103-118.

Supervision by a Nurse and Month of Pregnancy at First Visit	Per Cent of Total Group		Per Cent of Visited Cases With First Contact in Specified Month	Number of Women First Visited in Specified Month
	Visited in Specified Month	Cumulative Per Cent		
Number of Cases	100.0	100.0		304[1]
Number of Cases Visited	24.7	24.7	100.0	75
Month of 1st Visit				
1st–3rd	1.0	1.0	4.0	3
4th–5th	3.0	3.9	12.0	9
6th–7th	8.9	12.8	36.0	27
8th	6.2	19.1	25.3	19
9th	5.6	24.7	22.7	17
Not Visited	75.3			

[1]Eight cases are excluded from the total number of 312 cases and the number of cases visited because the month of first visit by the nurse was unknown.

Table 4. Percentage of maternity cases receiving prenatal supervision from a public health nurse in various periods of pregnancy for a series of rural cases in a special survey in Cattaraugus County, New York, 1929 to 1932.

cases for whom the physician requested nursing supervision was only 11, as shown in Table 5 which gives the source of the nurses' information about the cases visited. Although 146 women had been to their physician before the sixth month, only 8 of these cases were reported to the nurse by the physician, and these were not reported promptly since the nursing visits to these 8 cases were all made in the sixth month or later. One-fourth of the patients who received some nursing visits were discovered by the nurse and another one-fourth were reported to the nurse by another member of the Health Department or by a representative of an official agency in the County. The difficulty of learning about the prenatal cases early in pregnancy is a serious obstacle to effective preventive service, and, although the physicians could aid the nurse in case-finding, greater importance attaches to finding the cases which are not registered with a physician.

Frequent visiting of rural patients by the nurse is unusual and the average number of prenatal visits to this series of cases was 2.4.

Classification of Source of Information	P.H.N. Source of Information About Cases with Prenatal Supervision	
	Number	Per Cent
Total Cases	312	100.0
Total Visited in Prenatal Period	83	26.6
Source of Information Unknown	19	
Source of Information Known	64	100.0
Case Reported by Doctor	11	17.2
Case Reported by Self	12	18.8
Case Reported by Relative, or Other Nonofficial Agency	9	14.1
Case Reported by Official Agency	16	25.0
Discovered by Nurse while Visiting for Other Purpose	16	25.0

Table 5. Sources from which public health nurses learned about prenatal cases which were visited in a rural area of Cattaraugus County in 1929 to 1932.

Nearly one-third of the women received only one prenatal visit, and 5 were visited five or more times, eight visits being the most anyone received. More representative of the nursing supervision given after a case was "found" is the average number of visits per prenatal month of supervision which is given in Table 6. Such an average relates the number of visits made to the total months under care

Table 6. Average prenatal visits per case and per prenatal month under supervision, classified by month of pregnancy at first contact by public health nurse in a rural area of Cattaraugus County, New York, 1929 to 1932.

Month of Pregnancy at First Contact	Number of Cases Visited	Number of Prenatal Months for Care	Number of Prenatal Nursing Visits	Average Number of Visits	
				Per Case Visited	Per Prenatal Month
Any Month	71[1]	205	174	2.45	.85
1st–5th	11	62	40	3.64	.65
6th–7th	27	93	68	2.52	.73
8th	18	35	38	2.11	1.09
9th	15	15	28	1.87	1.87

[1]Four cases are excluded because the nurse was asked either by the family or by the doctor not to revisit the case after her first visit.

and permits an adjustment for cases which terminated early or were dropped at the request of the physician or patient. The average per prenatal month of supervision for all cases was 0.85 visits which means that the nurses made close to the equivalent of monthly visits. However, cases seen only in the last month had an average of 1.87 visits, and those under supervision for five or more months had only 0.65 visits per month.

Although nursing visits do not substitute for medical visits, it is of interest to determine the total number of contacts with either type of professional personnel which these women had during pregnancy. Six of the 62 women who did not visit their physician before confinement had been visited by a nurse; supervision of such cases is discontinued by the nurse after a few visits in accordance with usual nursing policy. Twenty-five per cent of the women had received only one or two health visits and only 16 per cent received eight or more health visits. For all women who received any supervision from either a physician or public health nurse, the average amount of prenatal care was 5.2 visits.

FACTORS RELATED TO AMOUNT OF PRENATAL CARE

Education by Nurses. In the present series of cases, only 24 women had been visited by the nurse before any prenatal medical care had been received and 18 of them later visited a physician for prenatal care. Case-finding and advice on the value of medical care during pregnancy by the nurses had been a very small factor in bringing patients in this series under medical supervision. Although the nursing contact with patients was established too late in most cases to be very effective in increasing the amount of early medical care, it was thought that education by a nurse at the time of a previous pregnancy might have had some influence on the medical care received for the current pregnancy. Records were available to indicate that 66 women had had nursing supervision with reference to a previous birth (maternity or infant supervision), and 20 per cent

of this group received no prenatal medical care as compared with 21 per cent for the entire series. Furthermore, among 69 multiparous women in the present series who had *not* had nursing supervision for a previous pregnancy, there was 19 per cent with no medical care for the current pregnancy. If the period of pregnancy at first visit to the physician and the frequency of medical visits are considered, there was no difference in the care received by the groups with and without nursing care for previous pregnancies. Thus, the data provide no evidence that previous education had effectively modified the current attitude toward the need for medical care.

Visits of the nurses during the prenatal period did seem to improve the regularity of the revisits of patients to the physician, although the opportunity to increase the amount of medical supervision was limited since the first nursing contact with cases was usually after pregnancy had advanced to the sixth month. Some evidence that the nurses did influence patients to *revisit* their physicians is obtained by comparing the revisits of patients visited by the nurses and those not visited. For this purpose, the patients who first visited a physician in the sixth, seventh, or eighth month of pregnancy were considered; and an index of the regularity of revisits was computed for the remaining months after the first visit to the physician on the basis of the ratio of visits[9] to the number of months. The following ratios were obtained:

Cases with First Medical Care in 6th-8th Month	*Revisits Per Prenatal Month*
Patients not visited by nurse (50 cases)	.45
Patients visited by nurse after first M.D. visit (13 cases)	.67
Patients visited by nurse before first M.D. visit (12 cases)	.53

[9] If the number of revisits exceeded the number of months, the revisits in this compu-

(Continued on page 185)

Economic Status. The families living within the survey area were given a rating on economic status based on the general impression formed by the investigator after repeated visits to the family. Table 7 and Figure 2 show the type of prenatal care by economic status of the mothers. The cases with any prenatal care have been classified into three broad groups, according to month prenatal care began and number of visits[10] made to a doctor, as follows: Class I, fair or good care; Class II, insufficient care; and Class III, poor care, or so few visits that no real supervision was possible. The classification is purely quantitative, and takes no account of the type of service a doctor may have given.

Table 7. Class of medical prenatal care, according to economic status of family, received by women in a rural area of Cattaraugus County, New York, 1929 to 1932.

Economic Status	Total No. of Women	Per Cent Reporting Specified Class of Prenatal Care[2]				
		Total	I	II	III	None
All Women	276[1]	100.0	33.7	19.9	25.7	20.7
Moderate	111	100.0	49.5	20.7	21.6	8.1
Marginal	80	100.0	28.8	27.5	23.8	20.0
Poor	85	100.0	17.6	11.8	32.9	37.6

[1]Excludes 21 abortions and 15 cases with care unknown.
[2] See footnote 10. Class I was fair or good care.

A greater proportion of mothers in the highest economic group received Class I care, as would be expected since private physicians gave the only medical supervision available. Not only are such mothers better able to pay for service, but, as a group, they presumably are more aware of the need for service. Fifty per cent of all mothers with a comfortable or moderate economic status visited

tation were counted as equal to the number of months so that the ratio of visits to months could not be greater than 1.0. This was done to eliminate weighting the average ratio with a large number of visits made by a few cases who were receiving treatment for some special health condition.

[10] (1) *Fair or good care* includes those women first seeing a doctor before the sixth month of pregnancy and having at least four visits; (2) *insufficient care*, those first visiting a doctor in the sixth to eighth month of pregnancy, with at least monthly visits, or those visiting earlier who failed to see their physician in the eighth or ninth month, but with at least three visits; (3) *poor care*, those seeing the doctor first in the ninth month of pregnancy, or seeing a doctor in the eighth month, but not in the ninth, or those seeing a doctor earlier, but with a total of only one or two visits. These standards were applied to all term births, but for premature births an adjustment was made in the number of visits required.

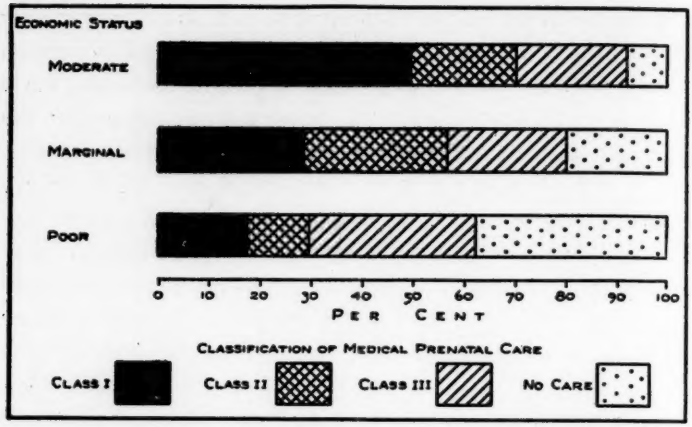


Fig. 2. Percentage distribution according to classification of prenatal care for maternity patients in families of different economic status in Cattaraugus County, New York, 1929-1932. Class I care represents fair or good prenatal care; see footnote 10 for description of each class.

their physicians early enough and often enough to receive fair or good prenatal supervision; 21 per cent had Class II and Class III care, respectively, while only 8 per cent did not see a doctor during the prenatal period. The proportion of women receiving fair or good care decreases, and the proportion receiving none at all increases significantly as the economic status is lowered. In the lowest economic group, only 18 per cent of the women had Class I supervision, while 38 per cent of them did not see a doctor before delivery. In a community where there are no prenatal clinics, the relation between the economic status of the family and the amount of prenatal supervision is very marked. Winslow[11] indicated this when he suggested the need in Cattaraugus County for . . . "the development of prenatal service in rural areas in the offices of private physicians on a standard fee basis, the payments to be made from the health budget when necessary."

[11] Winslow, C.-E. A.: HEALTH ON THE FARM AND IN THE VILLAGE. New York, The Macmillan Company, 1931, p. 6.

Although 60 per cent of the maternity cases which received prenatal nursing supervision were in families classified as of marginal or poor economic status, this was due to a higher birth rate in the low-income families. Approximately the same percentage of mothers in the highest income group and in the marginal and poor-income groups combined, 27.9 and 29.1, had some nursing supervision. If cases with only one nursing visit are excluded, the percentage in high-income and low-income families with two or more nursing visits also was about equal, being 19.8 per cent and 20.6 per cent. Economic status, therefore, had not been used by the nurses as a basis for selecting cases for service.

Age of Mother and Order of Birth. The need a mother may feel for prenatal supervision is influenced by her previous experience with pregnancy. A young woman having her first baby will seek advice and return for supervision more readily than an older woman who, having borne two or three children without mishap, thinks such supervision entirely unnecessary. This is brought out in Table 8, which shows the proportion of women who received

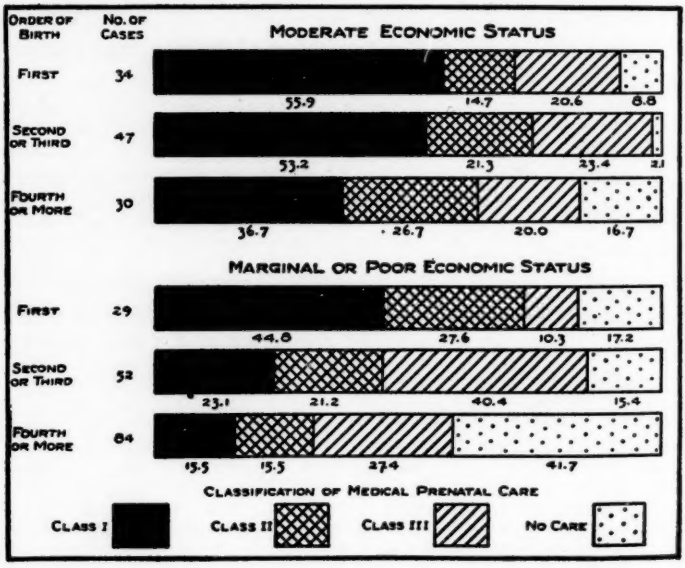
Table 8. Medical prenatal care by age of mother and by order of birth for women whose pregnancy terminated after the sixth month of gestation in rural Cattaraugus County, New York, 1929 to 1932.

Age of Mother and Order of Birth	Total	Per Cent of Cases with Specified Class of Medical Prenatal Care[1]				
		Total	I	II	III	None
Age of Mother						
Total	276	100.0	33.7	19.9	25.7	20.7
–25	108	100.0	37.0	24.1	25.0	13.9
25–34	114	100.0	30.7	21.1	25.4	22.8
35 or Over	54	100.0	33.3	9.3	27.8	29.6
Order of Birth						
Total	276	100.0	33.7	19.9	25.7	20.7
1st	63	100.0	50.8	20.6	15.9	12.7
2nd or 3rd	99	100.0	37.4	21.2	32.3	9.1
4th or More	114	100.0	21.1	18.4	25.4	35.1

[1] See footnote 10. Class I was fair or good care.

various amounts of medical care, according to age of mother and according to order of pregnancy. Age of mother *per se* did not seem to influence the amount of prenatal care as much as order of pregnancy. Although the per cent of cases with no prenatal medical care increased by age of mother, the proportions with each class of care did not vary greatly according to age. On the other hand, the amount of prenatal care varied inversely with the number of previous pregnancies these women had had, and for first pregnancies and fourth or higher order of pregnancies, the differences in the per cent with Class I care and in the per cent with Class III or no care, are large and statistically significant. Even the differences in the amount of care for second or third and later pregnancies are marked. In this series of cases, there was a definite

Fig. 3. Percentage distribution according to classification of prenatal care for pregnancies classified by order of birth and by economic status of the family, in Cattaraugus County, New York, 1929-1932. Class I care represents fair or good care; see footnote 10 for description of each class.



tendency for women to receive good supervision during the prenatal period for pregnancies of low parity and to neglect having care for pregnancies of high parity.

Since births of high order are more frequent in the poorest families, the lack of prenatal care for such pregnancies could be due to low economic status. This was in part true as about three-fourths of all births of the fourth and higher order were in families classified as of marginal or poor economic status, but the amount of prenatal care varied by parity for mothers in the same economic group. The distribution of mothers by amount of prenatal care, according to economic status of the family and parity, is shown in Figure 3. Only 37 per cent of the births of high order had Class I care as against 56 per cent of first births in families of moderate economic status, and in low-income families the percentages were 15 and 45, respectively. Regardless of income, there was some tendency for these women to be careless about having prenatal care for births of higher order, but this neglect was much greater in the poorest families.

PRENATAL HEALTH

A few studies of clinic and private physician patients have reported on the prevalence of various pathological findings which may be associated with pregnancy but little is known of the prenatal health of those women who see a doctor infrequently or not at all before delivery. In this respect, the data which form the basis of this report offer a unique opportunity for studying the frequency of complications during the period of pregnancy. It is true that the conditions or illnesses noted are those reported by the mother or family, and often are signs or symptoms of an abnormal condition rather than precise diagnoses or specific medical findings. When the patient did have medical care, the physician was asked to confirm the diagnosis and most of the more serious conditions were confirmed. The fact that nearly all the mothers were visited several

times during the prenatal period, regardless of any prenatal supervision, lends particular interest to this phase of the report.

Each woman was asked if she had any of the following symptomatic complaints which are related to conditions associated with pregnancy: nausea, swelling of face, hands or feet, varicose veins, "spots before eyes," constipation and heartburn. The period of occurrence and duration of symptoms also were usually recorded. In addition, a considerable number of chronic conditions and of acute illnesses were reported as complications affecting health during the prenatal period. In the following tables, minor illnesses reported to the canvassers, but not given as complicating pregnancy, are not included; and "spots before eyes," constipation and heartburn, occurring without other symptoms, also have been omitted. Multiple symptoms were grouped under one diagnosis when this seemed proper. For example, a woman reporting a kidney condition, persistent nausea, and high blood pressure, would be classified as a case with a kidney condition since the nausea and hypertension are common manifestations of the toxemia of pregnancy due to a kidney condition.

The total incidence of illnesses or symptomatic complaints, reported by 304 women, is shown in Table 9 in order of frequency. One hundred and forty-five, or about 48 per cent, of the women reported no complications during pregnancy. Edema of the extremities was the most frequently reported condition, and varicose veins was next in order, with a reported incidence of 34 and 20, respectively, per 100 pregnancies studied. Either of these conditions may be the forerunner of very serious trouble for a pregnant woman, but they also appear frequently with no further indication of a significant abnormal condition. Varicose veins or edema were listed as the sole or primary condition for 103 women. If they are excluded from the 159 women reporting any complication of pregnancy, only 56, or 18.4 per cent, of them reported other conditions or illnesses.

Cases of mild or unspecified albuminuria and kidney conditions (reported either as kidney trouble or nephritis) followed next to edema and varicose veins in frequency of occurrence, with incidence rates of 3.3 and 2.3, respectively, per 100 pregnancies studied. One case of eclampsia developed among the kidney cases. The

Table 9. Incidence per 100 pregnancies of reported prenatal complications and classification of conditions as sole or primary and contributory for a series of maternity cases visited in a morbidity survey in rural Cattaraugus County, 1929 to 1932.

Classification of Symptoms or Illness	Total Incidence per 100 Pregnancies	Number of Cases of Specified Diagnosis		
		Total	Sole or Primary[2] Condition	Contributory Condition
Total Pregnancies		304[1]		
No Complication Reported	47.7	145		
Any Symptom or Illness	52.3	159		
Edema	33.9	103	57	46
Varicose Veins	19.7	60	46	14
Albuminuria, Mild or Unspecified	3.3	10	10	
Kidney or Nephritic Condition	2.3	7	7	
Early Spotting or Bleeding	2.0	6	6	
Persistent or Pernicious Nausea	2.0	6	5	1
Hemorrhoids	1.0	3	1	2
Appendicitis	1.0	3	3	
False Labor Pains	1.0	3	3	
High Blood Pressure	.7	2	2	
Syphilis	.7	2	2	
Abscess (Breast and Rectum)	.7	2	1	1
Heart	.7	2	1	1
Goiter	.7	2	1	1
Prolapse of Uterus	.7	2	1	1
Diabetes	.3	1	1	
Asthma	.3	1	1	
Chorea (Last 2½ Months of Pregnancy)	.3	1	1	
Whooping Cough	.3	1	1	
Scarlet Fever	.3	1	1	
Fainting Spells	.3	1	1	
Bladder Trouble	.3	1	1	
Tonsillitis	.3	1		1
Ill-defined Pains, Symptoms, or Illnesses	2.6	8	6	2

[1] Record of prenatal health was lacking for 8 cases.
[2] The primary condition of two or more complications during pregnancy was selected somewhat arbitrarily with preference given to the more serious or more definite complication.

reported incidence of kidney conditions and eclampsia for this sample is very similar to that found by Tamis and Clahr[12] in a study of clinic patients at Morrisania City Hospital in New York City in 1934. Among 1,009 patients who registered in the antepartum clinic, there were 3 cases of eclampsia and an additional 15 cases classified as nephritic or pre-eclamptic. Persistent nausea and early bleeding or spotting each had an incidence rate of 2.0 per 100 pregnancies (6 cases). Only 2 cases of syphilis were reported, but it is known that few cases received any serological test. Except for cases with ill-defined symptoms, the other illnesses reported ranged in number from one to three cases. Eight women reported illnesses, such as "sick the last two months," or "in bed two weeks," or "felt badly throughout."

Table 10 shows the outcome of pregnancy for cases with a specified illness or complication. However, the small number of cases with any specified complication does not permit significant analysis of the relationship between a condition and the outcome of the pregnancy. About 92 per cent of the women with no reported complication were delivered of term live births, compared with 82 per cent of the women reporting some symptom or diagnosed illness. Although there was about an equal number of women with "normal" health and with some reported complication during the prenatal period, there were twice as many term stillbirths, twice as many premature births (live and still), and nearly three times as many abortions for the latter group. It is of interest, though not significant statistically, that for women whose *only* complication was edema, the combined stillbirth and premature birth rate was 7.1 per cent as compared with 4.8 per cent for the "normal" group. Edema associated with other conditions, except varicose veins, showed a marked relationship with the occurrence of premature and stillbirth. One or more stillbirths or premature births occurred

[12] Tamis, Abraham B., M.D. and Clahr, Jacob, M.D.: Antepartum Care: Its Advantages and Its Shortcomings. *The Journal of the American Medical Association*, July 17, 1937, cix, pp. 195-199.

in association with each type of condition characteristic of pregnancy disturbances, regardless of the small number of cases of each type. Only for the group who reported varicose veins and no other complication, except edema, was the pregnancy loss no greater than for the women with "normal" health. Early terminations and stillbirths were associated almost entirely with conditions incidental to pregnancy rather than general illness; the exceptions were abortions to 2 women with syphilis (one therapeutic and one illegal), and 2 abortions (spontaneous) in the 3 cases of appendicitis. Any

Table 10. Outcome of pregnancy for maternity cases reporting various prenatal complications in a morbidity survey in a rural area of Cattaraugus County, New York, September, 1929, to June, 1932.

Classification of Complications	Number of Cases	Outcome of Pregnancy					
		Term Birth		Premature		Abortion	
		Live	Still	Live	Still	Spontaneous	Induced
Total Pregnancies	304	264	9	10	2	15	4
No Complication Reported	145	133	3	4		4	1
Any Symptom or Illness	159	131	6	6	2	11	3
Edema, Total	103	93	4	6			
Edema Only	56	52	2	2			
Varicose Veins	60	56	2			2	
Varicose Veins Only	23	21	1			1	
Varicose Veins + Edema	21	21					
Albuminuria, Mild or Unspecified	10	7	2		1		
Kidney Condition	7	6		1			
Bleeding or Early Spotting	6	2		1		3	
Persistent Nausea	6	4				2	
Other and Ill-defined Conditions Associated with Pregnancy	14	9	1	1	1	2	
Appendicitis	3	1				2	
Hemorrhoids	3	3					
Syphilis	2						2[1]
Diabetes	1						1
Goiter	2	1		1			
Prolapse of Uterus	2				1	1	
Other Acute or Chronic Illness	10	9[2]		1			

[1]One maternal death caused by an illegal abortion.
[2]One maternal death; cause given as scarlet fever at delivery.

symptoms of complications seemingly should be viewed as possibly serious to the outcome of pregnancy. On the other hand, one-third of the premature births and 4 of the 15 spontaneous abortions occurred to women who reported no prenatal complications.

There were 2 maternal deaths in the series, one following an illegal abortion of a woman with syphilis and one from scarlet fever at time of delivery.

It is difficult to evaluate the relationship between prenatal supervision and the occurrence of complications or the outcome of pregnancies having prenatal complications. No attempt at determining such a correlation will be made. Patients who have had prenatal care are the ones who will know that albumin was present in the urine, etc., and those with definite symptoms will usually seek some medical advice. In the present series, no prenatal care was reported by 24 per cent of women with no complications and also by 24 per cent of women who had only edema or varicose veins or both, as compared with 10 per cent of the group who had other complications or illness during the prenatal period. The complications reported for which no medical care was obtained before delivery were one each of the following: whooping cough, in a patient who also had edema and varicose veins, a term live birth resulted; hemorrhoids and varicose veins, a term live birth resulted; tonsillitis and "kidney trouble," a term live birth resulted; persistent nausea and "felt badly for three months," an abortion resulted; an ill-defined illness for one week, an abortion resulted. The one woman who had eclampsia had visited her physician once in the first trimester of pregnancy but never returned for supervision. Approximately one-half of the women with complications other than edema or varicose veins had Class I prenatal care; obviously, it was common for these women to neglect their medical supervision even when there was good reason to be concerned about their own health.

DELIVERY CARE

Attendant and Place of Delivery. There was a physician in at-

tendance for all but three women in this series who delivered after the sixth month of pregnancy. Of these three, one was attended by a midwife and two had no attendant except female relatives. There was some medical care reported for 19 of the 21 abortions in the series. Forty-six different physicians had attended these women but more than 70 per cent had been cared for by ten physicians, each of whom had attended eleven or more cases.

Hospitalization for confinement is not usual for these rural women and only 34, or 11 per cent, were delivered in an incorporated hospital. An additional 7 per cent were delivered in a licensed maternity home in the area. Hospitalization of premature births and abortions is shown in Table 11.

Mode of Delivery and Complications. The history of delivery, like that of the prenatal period, was reported by the mothers, and the statements on type of delivery and on complications of labor and of the puerperium were verified by the physician only for some of the more serious complications. The mother was asked specifically whether the presentation was breech and whether version was done, whether forceps were used in delivery, whether lacerations were present, and to give any other complications of labor.

Table 11. Hospitalization for delivery of rural women in Cattaraugus County, New York, according to a special survey from September, 1929, to June, 1932.

Classification of Births	Number of Cases				Per Cent of Cases			
	Total	Specified Place of Delivery			Total	Specified Place of Delivery		
		Home	Maternity Home	Hospital		Home	Maternity Home	Hospital
Total Cases	312	255	23	34	100.0	81.7	7.4	10.9
Term Births[1]	278	230	22	26	100.0	82.7	7.9	9.4
Premature Births	13	8	1	4	100.0	61.5	7.7	30.8
Abortions	21	17[2]		4	100.0	81.0		19.0

[1]Includes 2 live births with gestation not specified.
[2]One case transferred to hospital two days after abortion.

Reports from the family on these procedures and on complications probably represent a minimum frequency.

The procedures at delivery and complications reported among hospital and home cases are shown in Table 12 for 287 women whose pregnancies terminated after the sixth month of gestation. Since cases in which some complication of delivery has been anticipated are apt to be hospitalized, it is not surprising to find relatively fewer normal deliveries reported among the hospital cases than among those delivered at home. Fifty-three per cent of the former, compared with 71 per cent of the latter, reported normal deliveries; that is, deliveries in which no operative or manipulative procedure was reported and in which no complicating factors were present or arose during the process of delivery.

The proportion of cases delivered with forceps seems high, especially for home deliveries, with 21.2 per cent in the home deliveries and 27.5 per cent in hospital deliveries. Unlike other studies, there was very little difference in the frequency of the use of forceps on cases delivered at home and those delivered in a hospital. In a recent

Table 12. Percentage of births of more than six months' gestation for which delivery procedures or complications of labor were reported by 287 women in rural Cattaraugus County, New York, in the period September, 1929, to June, 1932.

History of Delivery	Number of Births			Per Cent of Births		
	All Cases	Home Deliveries	Hospital Deliveries	All Cases	Home Deliveries	Hospital Deliveries
All Deliveries	287	236	51	100.0	100.0	100.0
Reported Normal	195	168	27	67.9	71.2	52.9
Delivery Procedures						
Forceps	64	50	14	22.3	21.2	27.5
Version	9	4	5	3.1	1.7	9.8
Breech	6	4	2	2.1	1.7	3.9
Cesarean	3		3	1.0		5.9
Labor Complications						
Lacerations	17	15	2	5.9	6.4	3.9
Hemorrhage	6	4	2	2.1	1.7	3.9
Other	10	8	2	3.5	3.4	3.9

study[13] of births in Buffalo, New York, a nearby urban area, the use of forceps was reported for about 29 per cent of the hospital cases compared with 9.7 per cent of home cases. On the other hand, for the total group of 11,780 births in Buffalo, the use of forceps was reported for 24.6 per cent as compared with 22.3 per cent in this series of rural births. Plass,[14] in a study of 40,138 births in Iowa, reports the use of forceps in 13.8 per cent of hospital cases compared with 4.5 per cent of cases delivered at home, and he observes that forceps extraction is necessary in from 3 to 5 per cent of all labor. Opinion differs as to the danger of forceps deliveries but it is apparent that physicians in Cattaraugus County, on the average, used forceps frequently.

Version was reported for only 9 deliveries, or 3.1 per cent of the births, and breech presentation for 6, or 2.1 per cent. The practice of version in this community was less than half as frequent as in Buffalo where version was reported for 7.8 per cent of the births, but among 1,714 hospital deliveries in Syracuse[15] in 1929-1933, version was done on only 4.1 per cent of the patients.

Cesarean section was performed on three mothers, or 1.0 per cent of all women in the study. The proportion of women delivered by this method varies widely in different localities. Three and four-tenths per cent of all births studied in Buffalo were delivered by Cesarean section, while only 0.4 per cent of the Morrisania City Hospital[16] patients were so delivered.

The reported frequency of hemorrhage and of lacerations is shown in Table 12. Two of the six cases of hemorrhage were women who reported forceps deliveries, and hemorrhage occurred in 3.1 per cent of the forceps cases compared with 1.9 per cent of the

[13] Israel, Marvin, M.D.: Maternal Mortality in Erie County, New York. *New York State Journal of Medicine*, September 1, 1937, xxxvii, No. 17.

[14] Plass, E. D., M.D.: The Difficulties and Dangers of Forceps Deliveries. *The Journal of the American Medical Association*, November 26, 1932, xcix, No. 22, pp. 1817-1819.

[15] Mellor, Lester R., M.D.: Trends in Obstetrics. *New York State Journal of Medicine*, October 15, 1937, p. 1764.

[16] *Op. cit.* Footnote 12.

cases with no operative procedure at delivery. Lacerations were reported by 17 per cent of women who had forceps deliveries but by only 2.8 per cent of those with non-operative deliveries.

There were no neonatal deaths among the births assisted by forceps. One of the three infants delivered by a Cesarean operation died and the cause of death given was prematurity. The stillbirth rate among the forceps cases was 3.1 per cent and for non-operative cases was 4.2 per cent. Thus, there is no evidence that the frequent use of forceps contributed to the neonatal mortality rate or the stillbirth rate. One stillbirth occurred among the breech deliveries and one among cases on which version was done—but the number of cases was too few to obtain a reliable rate.

Nursing Assistance at Delivery. Rural women who are delivered at home depend largely upon relatives or neighbors to assist the physician at delivery. In the present series, a registered nurse was present to assist the physician at 36, or 15 per cent, of the 238 home deliveries, exclusive of abortions. For 16 of these 36 cases, the public health nurse gave the assistance at delivery, and the Department of Health, therefore, provided nursing delivery care for 6.7 per cent of home deliveries in this rural area. During the period of this study, it was the policy to give nursing assistance at delivery when the physician urged it but not to promote a demand for such service.

POSTNATAL PERIOD

Medical Care. It may be assumed that women who are confined in a hospital receive regular and adequate supervision during the puerperium, but the great majority of mothers in this rural area were delivered in their own homes. Some evidence of their medical supervision may be indicated by the number of visits made after delivery by the doctor. Two hundred and thirty-nine women delivered at home reported an average of 1.8 visits from the doctor following the delivery. This low average is explained in part by the fact that 66, or 27.6 per cent, of the women were not seen again

after delivery by their doctors. One-fourth of the women received one postnatal call and 37 per cent received two or three postnatal calls from the physician. Among women who saw their doctors during the prenatal period regularly enough to have received fair or good supervision, 21 per cent were not seen again after delivery. Obviously, there was a lack of realization of the importance of supervision on the part of the mother, and a failure to assume responsibility for her welfare on the part of the doctor, who should be particularly alert for any symptoms of trouble in women delivered at home, where aseptic precautions necessary for the safety of the mother are difficult to maintain.

The postpartum medical examination at about six weeks after delivery is an important part of complete maternity supervision. Two hundred and eight, or 78 per cent, of the 267 women reporting on this phase of the history received no postpartum examination by a doctor. Seventeen women who had examinations, received them from one to three weeks after delivery, or before a sufficient time had elapsed for the doctor to determine the degree of normality attained. Only thirty-seven women were examined one month or more after delivery. Five women who reported an examination did not state the time at which it was made. It is interesting to note that among women receiving the most prenatal supervision and for whom there was some evidence of an interest in good medical supervision, only about one-fourth received their examinations a month or more after delivery. None of the women who had no prenatal supervision returned for a postpartum check-up. It seems apparent that there is serious need for further educational work in regard to postpartum supervision among both the mothers and physicians of this rural area.

Nursing Supervision. The public health nurse gave some postnatal supervision to 94, or 30 per cent, of all cases in this series. This is a slight increase over the 24.5 per cent reported by Randall[17] from

[17] *Op. cit.* Footnote 8.

the study of service in 1930. Most of the cases visited in the postnatal period had been seen in the prenatal period, but 27 new cases received postpartum supervision. On the other hand, 16 cases with prenatal service had no postnatal visits from the nurse; only 3 of these cases were delivered in a hospital. Of the total group which received postpartum calls from the nurse, 82 were home deliveries, and nursing supervision was given to 32 per cent of all home deliveries. The time at which postpartum supervision was started by the nurse and the number of visits was known for 83 of the cases carried, and these data are shown in Table 13. Twenty-four per cent of them were visited on the first day, and 18 per cent from the second to seventh days, or about 42 per cent had some supervision during the first week after delivery. Early postnatal care is essential if it is to be effective and the record for prompt visiting was very good for this series of cases. When supervision started during the first week, the nurse usually visited with a fair degree of regularity, but none of the cases first visited after the third week received more than one or two visits. The average number of visits made by the nurse to the cases carried for postpartum supervision was 2.4.

The records of the services rendered in the home indicated that some postpartum nursing care was given to 27 per cent of the women. This included 11 per cent of the cases to which bedside care

Table 13. Time between delivery and first visit by public health nurse, and number of postnatal visits to 83 rural women in Cattaraugus County, New York, who were included in a special survey, 1929 to 1932.

Days After Delivery	First Visit in Specified Time		Number Cases With Specified Visits			
	Per Cent	Number	1–2	3–4	5–6	7 or More
Total Cases	100.0	83	55	17	7	4
1st Day	24.1	20	3	8	6	3
2nd–7th	18.1	15	7	6	1	1
8th–21st	14.5	12	9	3		
22nd–28th	13.3	11	11			
29th or Later	30.1	25	25			

was given as a demonstration of care to some one in the home.

Postnatal Health. The reported frequency of complications or abnormal conditions during the puerperium is admittedly very unsatisfactory and incomplete for this group. Conditions serious enough to have required medical care and various ill-defined symptomatic complaints accounted for most of the complications reported. There is no record of temperature available for women delivered at home and cared for by the family or neighbors, and, the failure of most of the group to have postnatal medical supervision and a postpartum check-up makes it possible for many conditions to go undetected. The various symptoms and complications reported are listed in Table 14, and the medical care received is indicated.

Anemia and ill-defined symptoms, such as "marked fatigue" or "backache," were reported most frequently with seven cases each, or a case rate of 2.4 per 100 pregnancies delivered after the sixth month of gestation. Puerperal diseases of the breast come next in order with six cases, and four women reported lacerations or unspecified condition needing repair. Other conditions noted included: two cases of phlebitis, two cases of abnormal lochia or menstruation, and one kidney condition, a complication of the prenatal period which continued during the puerperium. Two hundred and forty-nine, or about 86 per cent of the 290 women who were delivered after the sixth month of gestation, reported an uneventful puerperium. Only six of the twenty-one women whose pregnancies terminated in abortion reported no complication. The frequent occurrence of complications with abortion may represent the continued presence of a defect or condition which originally caused the loss of the fetus, as well as the added risk of infection following abortion.

It is of especial interest that so many of the women who reported some complaint after childbirth had very little medical care. One-sixth of the group with a reported complication had no medical

care after confinement, and nearly one-third received only one or two postnatal visits. Apparently these women accepted poor health

Table 14. Frequency of various complications during the puerperium and the medical care reported by maternity patients in a special survey in rural Cattaraugus County, New York, 1929 to 1932.

Classification of Complications	Case Rate per 100	Number of Cases	Postnatal Medical Care[1]				
			Hospital Deliveries	Home Deliveries			
				3 or More Visits	1–2 Visits	None	Unknown
Total Pregnancies 7–9 Months		290[2]	53	59	103	62	13
Normal Puerperium	85.9	249	40	49	91	57	12
Any Complication	14.1	41	13	10	12	5	1
Backache or Other Ill-defined	2.4	7		1	5	1	
Anemia[3]	2.4	7	2	3	2		
Puerperal Diseases of Breast	2.1	6	3		1	2	
Repair Needed, Lacerations and Unspecified	1.4	4	2	1	1		
Varicose Veins or Hemorrhoids	1.4	4	2		1		1
Phlebitis	.7	2	1			1	
Abnormal Lochia or Menstruation[3]	.7	2		2			
Prolapse or Displacement	.3	1		1			
Hemorrhage	.3	1	1				
Kidney Condition	.3	1			1		
Respiratory and Other Acute Conditions	2.4	7	2	3	1	1	
Total Abortions		21	5[4]	4	7	4	1
Normal Puerperium	28.6	6	3	1	2		
Any Complication	71.4	15	2	3	5	4	1
Abnormal Lochia or Menstruation	14.3	3			1	2	
Septicemia[5]	9.5	2	1	1			
Backache or Other Ill-defined	9.5	2		1		1	
Repair Needed, Lacerations and Unspecified	9.5	2		1	1		
Anemia	4.8	1			1		
Prolapse or Displacement	4.8	1					1
Hemorrhage	4.8	1				1	
Respiratory and Other Acute Conditions[5]	19.0	4	1	1	2		

[1] Number of postnatal visits does not include the delivery call.
[2] One case has been excluded because there was no report on the puerperium.
[3] One case appears under both anemia and abnormal lochia or menstruation.
[4] Includes one case which was delivered at home and transferred to the hospital two days later with septicemia.
[5] One case appears under both septicemia and respiratory and other acute conditions.

after childbirth as something to be expected or endured at least. It is well known that it is easier to interest a mother in giving good care to her child than in taking care of herself. The average mother probably has prenatal care as much for the sake of the baby as for herself, and she seeks medical care in the postnatal period only in case of very serious illness.

SUMMARY

Special histories of the health of 312 maternity cases and of medical care and public health nursing supervision received by them were obtained during the course of a periodic morbidity survey in rural Cattaraugus County, New York, from September, 1929, to June, 1932. From the detailed analysis presented, a few results which are suggestive of local conditions may be summarized.

Medical Prenatal Care:

None for approximately one-fifth of the cases.

Only one-third of the cases visited a physician before the sixth month of pregnancy and also made a total of 4 or more visits (Class I care).

With advancing order of birth, there was an increase in the percentage with very little care.

Economic status was an important factor, and only 17.6 per cent of women in families classified as "poor" had Class I care; 37.6 per cent had no care.

Delivery Care:

A physician attended all but three deliveries.

Eleven per cent were hospitalized and 7 per cent were delivered in a maternity home.

Forceps delivery was reported for 22.3 per cent of cases, excluding abortions. One per cent had a Cesarean section.

Medical Postnatal Care:

The average number of physician visits to patients delivered at home was only 1.8; 27.6 per cent of cases were not visited after delivery, and 25 per cent received only one postnatal visit.

Fourteen per cent of women reported a postpartum examination one month or more after delivery.

Nursing Supervision of Maternity Cases:

Eighty-three cases (26.6 per cent) were visited in the prenatal period; about one-half of cases visited were first seen in the last two months of pregnancy.

Prenatal visits averaged 2.4 per case and 0.85 visits per prenatal month under supervision.

A nurse assisted at 6.7 per cent of home deliveries.

Postpartum supervision was given to 30 per cent of the total group, and 42 per cent of visited cases were seen within one week of delivery.

Prenatal care obviously was neglected by the majority of maternity patients and, in spite of the educational work of the Health Department in the previous six years, indifference prevailed even when illness or symptoms of pregnancy complications occurred. There was some evidence that prenatal cases visited by a nurse were more regular in their revisits to the physician than those not visited; but patients with nursing supervision for a *previous* pregnancy did not obtain more medical prenatal care for the current pregnancy than the average patient. More study of methods for effective educational work is needed.

Available facilities for care which would remove the economic barrier to good care should contribute to higher standards of service in the County. A program to obtain financial aid for maternity care of patients in the lowest income group was begun toward the end of the survey period.

Medical supervision after delivery for rural home deliveries was extremely limited. This is a critical period for the new-born infant as well as for the reestablishment of normal health of the mother.

ANNOTATIONS

THE TREND OF DIFFERENTIAL FERTILITY IN ENGLAND

THE general decline of fertility in western civilization and the inverse association of fertility with social status, reported with monotonous consistency from many sources, have obscured more intricate cross currents and dynamic factors which afford significant clues to the unpredictable future. We are indebted to John W. Innes[1] for a painstaking search for such factors in English data. This study should be read in conjunction with the important studies by D. V. Glass, which refer to similar materials.[2] The results obtained by these scholars are complementary, and in the main, mutually confirmatory.

Detailed treatment of legitimate and illegitimate birth rates confirms the thesis that a marked decline in fertility began in England at about the time of the famous Bradley-Besant trial in 1876. However, there were significant differences in fertility among social classes in England in the mid-Nineteenth Century; and earlier decline in fertility is indicated for all social classes except miners. Accelerated decline in the fertility of all social classes and the widening of class differentials during the last quarter of the Ninteenth Century are clearly demonstrated by the Registrar-General's monumental study, FERTILITY OF MARRIAGE, based on 1911 Census data. Unfortunately there are no comparable data for recent decades. It is interesting to observe, however, that Glass's coefficients of variation for gross reproduction rates by counties at twenty-year intervals reach a peak in the period 1910-1912. The coefficient for 1930-1932 is much

[1] Innes, John W.: CLASS FERTILITY TRENDS IN ENGLAND AND WALES, 1876-1934. Princeton University Press, 1938, 152 pp.

[2] Glass, D. V.: Changes in Fertility in England and Wales, 1851 to 1931. *In:* Hogben, Lancelot, *Editor.* POLITICAL ARITHMETIC. London, Allen and Unwin, 1938, pp. 161-212.
——: Fertility and Economic Status in London. *The Eugenics Review*, July, 1938, XXX, No. 2, pp. 117-124.

lower than that for 1910-1912 (133 as compared with 195); but by this time the gross reproduction rate for England had fallen below unity.

For the study of recent trends in fertility in relation to economic status, both Innes and Glass turn to data for London boroughs, with reference to Heron's study of such relationships in 1851 and 1901. Both authors experiment with several indices of social status, and introduce independent refinements in handling the data. The most interesting technical problem relates to measurement of fertility. Innes uses general marital fertility rates (births per 1,000 married women aged 15-49 years) for three-year periods, with an adjustment for age based on the regression of average age of wives on fertility, by boroughs. Glass uses estimated gross reproduction rates (summation of age-specific maternity frequencies, daughters only) derived by indirect standardization, since births have not heretofore been reported by age of mother in England. Innes exhibits the logical imperfection of indirect standardization, as contrasted with direct standardization though, as it happens, Glass's application to this particular problem was not available when this statement was prepared.[3] Innes's theoretical position is valid. However, Stouffer[4] has shown through experimentation that indirect standardization yields reasonably satisfactory results if the standard population does not vary widely from the populations under observation with respect to the distribution of the variable in question. To the reviewer it seems that to eschew indirect standardization for age in studying fertility and to place dependence on adjustments by the regression of average age of wives on fertility is "to strain at a gnat and swallow a camel." In any case, the results obtained by Innes and Glass are in substantial agreement on the central issue.

These studies demonstrate that there has been no substantial change in the coefficient of correlation between fertility and social status in London during recent decades, but that the variability of areas as regard fertility decreased by about one-half during the twenty-year interval 1910-1930. The regression of fertility on social status, by boroughs, has been materially reduced. In other words, it was quite as likely for poor boroughs to show higher fertility than more prosperous boroughs in 1931 as in 1911, but the magnitude of the difference was much less at the

[3] Innes, *op. cit.*, Appendix I.

[4] Stouffer, Samuel A.: The Methodological Considerations in Comparisons of Rates for Geographic Areas. A paper read at meetings of the American Statistical Association, held in Atlantic City, December, 1937.

later period. Innes shows that the same trend is continued in a comparison between rates for 1931-1933 and 1934.

A further important contribution by Innes is made through isolating the trend in the poorest fifth from trends in four other classes of boroughs. This analysis shows that the high correlation between fertility and social status in London is chiefly due to the conspicuously high fertility of the very poor boroughs. The differences between the other groups have been small, and there has been some crossing of trend lines among them. Decline in fertility in the poorest boroughs has paralleled that in the others, but the relative differential had not narrowed up to 1931-1933. The data for 1934 give some suggestion of a narrowing of this differential; but the outlook is uncertain.

The broad implications of these studies, considered with reference to studies in the United States and other countries, seem to the reviewer to be somewhat as follows. Regional and social differentials are in part a phenomenon of the general transition from "natural," uncontrolled fertility to "rational," controlled fertility, which is accelerated in some groups and retarded in others. He is confident that the wide differentials between regional groups in the United States will be greatly reduced during the next few decades. Among urban populations, the poorest families show the greatest lag in family limitation. Whether and how long the economically lowest stratum will continue to be characterized by disproportionate fertility cannot be foretold. In any event, for the present and for some decades to come, high fertility is concentrated in the very areas and families where conditions unfavorable to child development are most apparent.

FRANK LORIMER[5]

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STUDIES IN HUMAN FERTILITY

THE latest product of the fruitful labors of Professor Raymond Pearl[1] and his laboratory assistants is one of the most interesting and significant contributions ever made to the study of basic population ques-

[5] Secretary, Population Association of America.

[1] Pearl, Raymond: THE NATURAL HISTORY OF POPULATION. New York, Oxford University Press, 1939. 416 pp. $3.50.

tions. It presents the results of a truly prodigious amount of statistical analysis in a clear expository style. In spite of its numerous tables, graphs, and statistical manipulations, the book is remarkably free from obscurity and ambiguity. Its value is greatly enhanced by eighteen pages of notes following the text, and by two appendices and a bibliography of about 700 titles. The latter alone makes the work indispensable for any student of human biology in its broader aspects. Much of the material has been published in scientific journals here and there and it is a great service to have these scattered researches brought together into a unified treatment. This book will stimulate numerous additional studies because it is highly suggestive of methods, sets up a good many precisely calculated marks to shoot at, and raises a number of puzzles for which answers can be found only by collections of *ad hoc* materials. Moreover and meanwhile it places much discussion on a sounder, more realistic basis.

For our purposes the treatise may be divided into four unequal parts. The first two chapters (97 pages) deal with the biological aspects and background of fertility. The second part (Chap. III, 71 pages) studies the present expression of fertility in the American population. The third part (Chaps. IV and V, 79 pages) presents the results of an investigation, made possible by the Milbank Memorial Fund, of the reproductive histories of some 30,000 American women, with special reference to the extent and effectiveness of their contraceptive efforts. Finally, there is a short chapter (39 pages) on the past, present, and future of world population, a chapter not very well integrated with the main body of the work.

The first part deals with such basic matters as the survival and reproductive urges; the inheritance of fertility; the variations of fertility with age, class, and race; the reproductive span; frequency of coitus and its relation to pregnancy rates; "litter size"; and reproductive wastage in relation to race and contraceptive effort. While these matters have been treated by various students and our author draws upon their results from time to time, there are, in addition to his summaries and reanalyses, some noteworthy original additions. For example, the study of the decline of fertility with age (pp. 39-45), not as manifested by women viewed in the large but by a highly selected group of women who continued to be overtly fertile to specified age classes, leads to the conclusion that about 56 per cent of the women who are previously fertile cease to be so at central age 27.5 years. The table (1, Appendix 1) presenting this material suggests that the lower the initial fertility (ages 15-19), the

higher the subsequent level of fertility and the longer it continues. The figures on copulations per pregnancy by age are somewhat surprising, but quite clearly reveal man as a poor breeder.

The study of the reproductive pattern in the United States in 1930 reveals a number of interesting and some surprising results. It is estimated roughly that only 7.4 per cent of the theoretically physiologically capable women bore a child, live or still, in 1930 (p. 102); this percentage, for live births only, in twenty-three identical states, dropped from 9.12 in 1920 to 6.99 in 1930 (p. 145). If various allowances are made for sterility, sickness, and other factors, it is concluded that not over 10 per cent of the physiologically capable women actually bore a child in 1930. It is found that the nativity classes bore children in 1930 almost exactly in proportion to their numbers in the population. This was a change from 1920 when the native-white women were contributing less than their share. One factor here is, of course, the higher age distribution of the foreign-born women. Another, to which more attention should be given, is the addition to the "native born" of the American-born daughters of prewar immigrants. These daughters were relatively fertile recruits to the ranks of the native born. They help to explain also the fact that the decline in fertility, 1920 to 1930, was less for the native than for the foreign or Negro mothers, respectively 18, 39, and 27 per cent. It is significant that this decline was least in the age class 15-19 and increased with advancing age. Does this indicate some revival of the desire for children among young married people; or is it merely due to the fact that most couples wish one or two children at least and want them early; or does it mean that the young things use birth control little and badly? The marked decline among the colored population cannot reasonably be explained as due to changes in proportions married, nor by age changes, nor by improved contraceptive technique, except perhaps in part; one may surmise that it was due to increase of sterilizing infections.

There are numerous other suggestive findings in this section. One is struck, however, with a certain variability in findings, due to diversity of samples and the necessity of resorting to various assumptions in the treatment of materials not collected to answer specific queries. While it seems clear that the Negro women breed earlier and show less wastage, they reveal in two studies higher age-specific pregnancy rates (pp. 25 and 88-90), but in the nation as a whole they show lower age-specific birth-rates, but a higher weighted mean birth rate. The fact that the whites

and the Negroes exhibit about the same mean relative fertility, though one uses contraception less and with less effect than the other (also has higher pregnancy rates and less wastage) is, indeed, somewhat of a dilemma, as the author says (p. 114). Then one wonders how much value attaches to the long calculation under varied assumptions designed to estimate the effectiveness of contraceptive practices in the American population (pp. 151-160), when, at the end, the author acknowledges that there has been no way of taking into the account the really successful contraceptors, and is reduced to the rough guess that, if they were included, the percentages of effectiveness would be about doubled.

The third part, to which the others appear to be preliminary, analyzes the reproductive histories of upward of 30,000 women. These histories were gathered under the very best auspices and undoubtedly represent the most reliable and extensive set of data thus far collected on the subject of contraception. Moreover, the group appears to be representative of the American population in several important respects. It is estimated that 55 to 60 per cent of the sample had made some contraceptive effort, the percentage being much higher among the prosperous and the well educated. The effectiveness was also greatest among those who used it most. The question remains, however, as to how far these results are truly representative of what is taking place in the American population. One must continually remind himself that Pearl's data do not include those contraceptors who are most successful in the same proportion that they include the less successful. Moreover, while his "noncontraceptors" constitute a clean-cut, homogeneous group, in that they had none of them attempted birth control at any time in any manner, the "contraceptors" are a heterogeneous category, including all the others. It may reasonably be assumed that women who at no time tried birth control were as a class either fairly content to have all the children nature would give them, or were inhibited by fear, moral, or religious feeling from interfering in any way with nature. It is not surprising that the pregnancy wastage, and especially that due to criminal abortion, is small in such a group. In the other category, however, may well have been a number of women who had resorted to abortion *before* they attempted contraception, as well as all those who used contraception either clumsily or intermittently.

Such considerations raise some doubt as to the value of his figure as to the efficiency of contraception, especially in the case of the multiparae.

Some of these women, no one knows what proportion, would have had one or several children before they began the use of contraceptives, and all these births would have been credited to them. The difference between them and the noncontraceptors (see method pp. 209 and 215) would thus have been appreciably reduced. Then the noncontraceptors would, in all probability, include the larger proportion of the women of low marital and natural fertility; the contraceptors, the larger percentage of those with relatively high marital and natural fertility. There might well be considerable difference in the ease with which fertility was controlled by these two groups.

The final chapter is notable for its revision of the estimate of world population limit under present trends, which increases the limit by 31 per cent. One may conclude that the calculation of asymptotes is a pleasant pastime for the mathematically inclined, but not to be taken too seriously as a prophecy of what will happen. (See in this connection the estimate of the Algerian population in Vol. VI, *Congrès international de la population* in comparison with Pearl's 1925 estimate.) This chapter, however, makes it clear that the world is getting full of people and that its resources are very probably undergoing some depletion. One might well ask what can one do about all this; our author's answer would seem to be "Better leave matters to nature."

If space permitted one would like to comment on this and several other predilections of the author. He scorns the eugenists and dislikes the birth controllers. So far as this means merely that he does not wish to be associated with any brand of crusaders, well and good. Unfortunately it leads him to put into the minds of the contraceptionists the very absurd assumption that every copulation leads to a pregnancy (pp. 70-71). It leads him to imply that poor contraception increases the abortion rate (pp. 94, 222, 230, 239-240). This thesis of "the working partnership between criminal abortion and birth control" runs as a sort of minor theme through the book. Since contraception is shown on every count to be more or less effective, one may reason as follows: among women wishing to avoid pregnancy some who try birth control will be successful; some who fail will, for various reasons, bring the pregnancy to term; others who fail will resort to abortion. May one conclude that therefore there are more abortions than there would have been in the absence of contraception? In a group of women determined to avoid a birth at all costs, the successful contraceptors will show fewer abortions. Our author,

himself, notes (pp. 241 and 223) regarding the highest economic class, "their proportionately infrequent resort to criminal abortion is to be found in the relatively high efficiency of their contraceptive efforts."

Other predilections are the author's favor for Doubleday as against Spencer, though there are several places where the latter's thesis, which certainly needs a modernized restatement, might well apply—places which puzzle Professor Pearl (pp. 37, 79, 211, etc.). Then there is the question of density, which is brought in in many places, though now it seems to be less density as such and much more the social life conditions associated with urbanism and industrialism. Finally, there seems to be some reliance on some mystical "innate powers of adaptation" to bring us out of the mess into which we have confessedly gotten ourselves. One may well share the author's skepticism as to the possibility of effective collective action, but in last analysis one must put his faith in human efforts guided by science or in what for all practical purposes is God. The scientist will scarcely hesitate to make his choice.

FRANK H. HANKINS[2]

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THE VOLUNTARY CONTROL OF FERTILITY

THE new edition of Dr. Dickinson's CONTROL OF CONCEPTION[1] answers an increasing demand for an authoritative text on the techniques for controlling fertility. It deals with all aspects of fertility control and offers to the inquiring student a wealth of information on contraception, sterilization, and therapeutic abortion.

The present edition includes new material on the comparative effectiveness of different types of contraception as used in selected population groups. It summarizes recent research on the "safe period" and includes many new diagrams and drawings, illustrating the relation of the techniques of contraceptive practice to human sex anatomy.

On the basis of the latest research in the chemistry of spermicidal compounds and on the quality of a number of commercial contraceptives, Dr. Dickinson frankly recommends several commercial brands of con-

[2] Professor of Sociology, Smith College.

[1] Dickinson, Robert Latou: CONTROL OF CONCEPTION. Baltimore, The Williams & Wilkins Co., 2nd Edition, 1938.

doms, diaphragms, jellies, and creams. The medical profession may be profoundly grateful for the publication of such a "white list." The approval or disapproval of commercial contraceptives is logically a function of the Councils of the American Medical Association, but until they begin to exercise this function, delegated to them in 1937,[2] the researches undertaken under the auspices of the National Committee on Maternal Health offer the only reliable source of information on commercial contraceptives.

As in the earlier edition, the book includes excellent chapters on the indications for and techniques of sterilization and therapeutic abortion. An entire chapter is devoted to the details of clinic organization, equipment, and architectural planning.

Due emphasis is placed on the positive as well as the negative aspects of the control of conception and the author urges the development of a well-rounded approach to problems of fertility. He believes that clinics should be equipped to treat sterility and to advise on marital adjustment as well as to prescribe contraceptives when they are indicated. It is to be hoped that the new text will be widely consulted by physicians and medical students.

REGINE K. STIX, M.D.

[2] *Journal of the American Medical Association*, November 5, 1938, 111, No. 19, p. 1770.